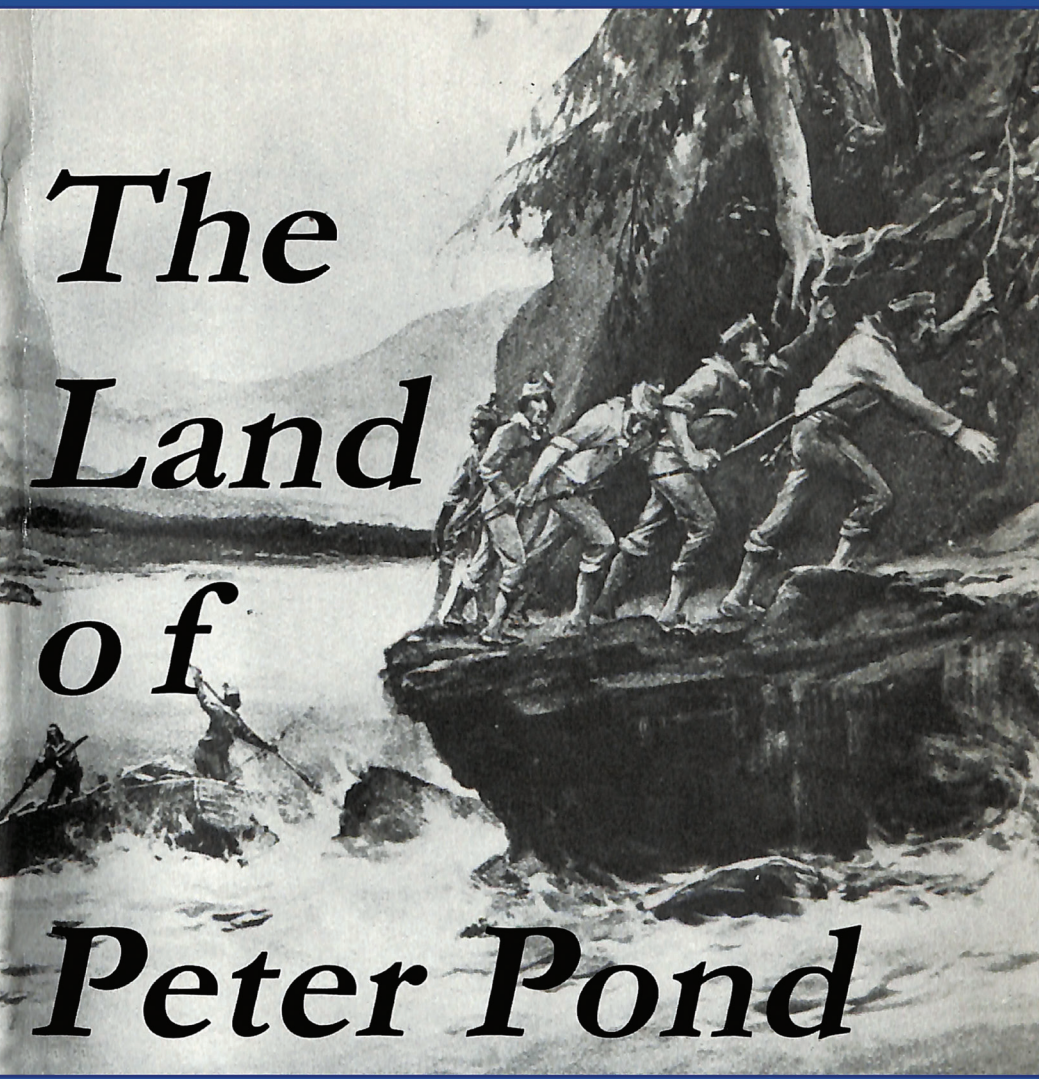

The Land of Peter Pond

Edited by John W. Chalmers

Canadian Circumpolar Institute (CCI) Press
University of Alberta

Re-issue of Occasional Publication No. 12

The Land of Peter Pond

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G.A. Lester, Cartographer

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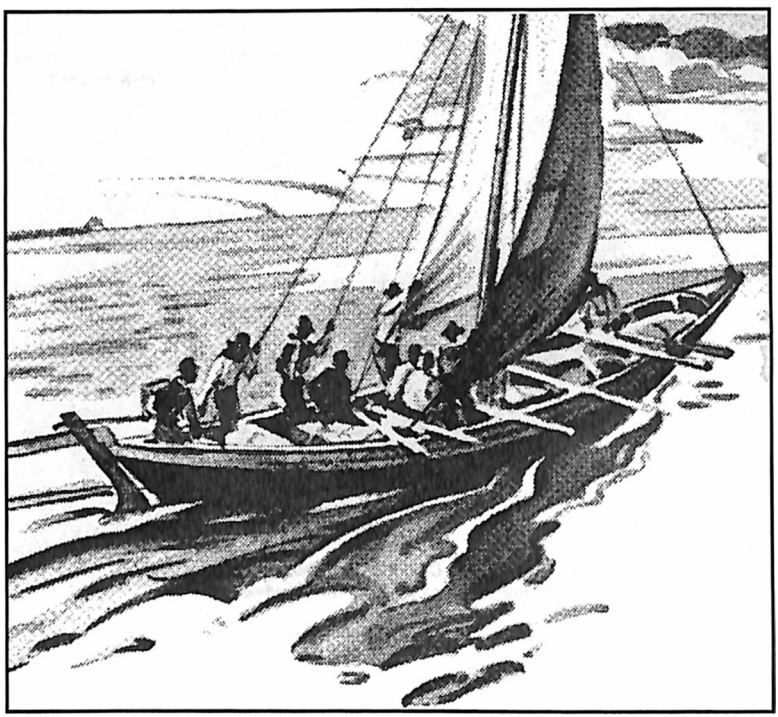


York boat under sail. Hudson's Bay Company.

Table of Contents

Introduction
Alberta's Oil Sands–John W. Chalmers iii

Chapter One
Wood and Water, Land and Oil–William C. Wonders 1

Chapter Two
Moose and Muskeg, Birch and Beaver–P.D. Lulman 21

Chapter Three
People of the Boreal Forest–Hugh A. Dempsey 33

Chapter Four
A Century of the Fur Trade–John W. Chalmers 51

Chapter Five
Steamboats Round the Bend–John W. Chalmers 77

Chapter Six
The Muskeg Flier– John W. Chalmers 95

Chapter Seven
Wayfaring, Airborne, and Earthbound–John W. Chalmers 113

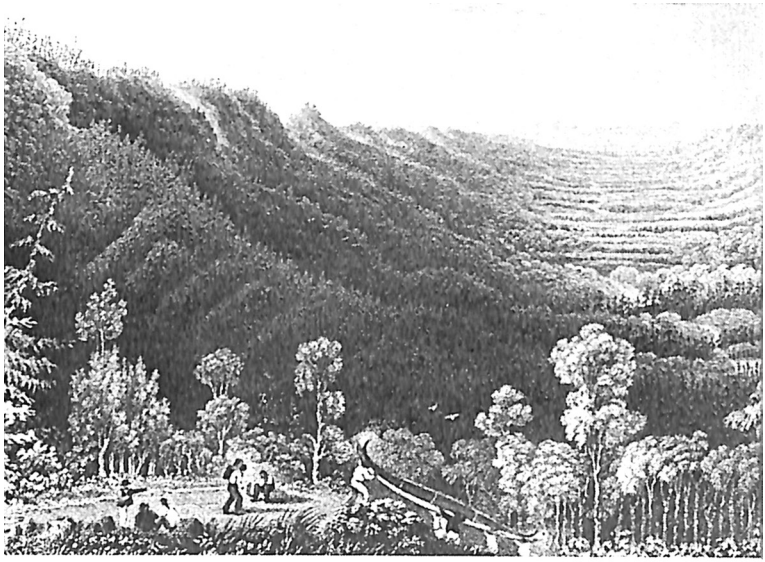
Chapter Eight
Boom and Bust, Bust and Boom–Edgar D. Cooke 127

Chapter Nine
The Long Technological Search–James M. Parker 141

Chapter Ten
On Stream–Gerry Lock 159

Notes on Contributors 171

Index 173



Vale of the Clearwater River from the Methys Portage. Drawn by Lieut. Back, July 16, 1825. Published April 1828 by John Murray, London.

Introduction

Alberta's Oil Sands

John W. Chalmers

In an era of actual and threatened energy shortages, Canada and indeed all of North America are paying increased attention to the fabulous oil sands of northeastern Alberta. Although these sands are rich in their promises for the future, they are no new discovery; fur traders and explorers have commented on their existence for two hundred years. And for more than half a century, scientists, engineers, and technicians have wrestled with the problems of separating the oil from the sand and delivering it to the market at a competitive price.

But these rich resources do not exist *in vacuo*, so to speak, simply as a geological phenomenon or problem to be solved solely by technological strategies. They underlie and are part of a natural and human environment. Any exploitation of the oil sands, by strip-mining and possibly other technologies, is having and will continue to have enormous consequences, not always foreseen, on the region and its people. For example, stripping the indigenous vegetation affects the wildlife and drainage, and may result in an entirely different plant habitat. The rivers and streams may change in volume and regularity of flow, and in the purity or otherwise of their waters with resultant changes all the way to the shores of the arctic and beyond. Industrialization produces modifications in the lifestyle of the aboriginal inhabitants, not always either beneficial or welcome. Transportation patterns, whether by road, rail, water, air, or pipeline,

are modified north to Lake Athabasca or farther, and south to Edmonton. These, in turn, produce secondary and tertiary effects.

The purpose of this publication is not to be a manual on the petrochemical industry of northeastern Alberta, but to describe briefly, and in non-technical terms, its oil sand area and its people, and to tell something of their rich historical and other background over the past two centuries.

Acknowledgements

In addition to its debts acknowledged elsewhere, the editors wish to express their appreciation for help rendered by the following: Alberta Department of Highways and Transport, Alberta Northwest Chamber of Mines–Oils–Resources; Alberta Research Council; Eldorado Aviation Ltd.; Energy Resources Conservation Board; Glenbow-Alberta Institute; Hudson's Bay Company (and The Beaver); Northern Alberta Railways; Northern Transportation Co. Ltd.; Pacific-Western Airlines and, to the secretarial staff of the Department of Education Foundations, University of Alberta. Every effort has been made to locate, and secure permission from owners of presumably copyright material, in one or two instances without success, in which cases our sincere apologies are tendered.

Edmonton, October 1974
John W. Chalmers and the Staff of the Boreal Institute for Northern Studies

Chapter One

Wood and Water, Land and Oil

The Geographic Setting

William C. Wonders

> On account of the rain, our camp was formed in the woods, and was both wild and picturesque. Three rousing fires were built (one for each boat) and around these in the darkness flitted dusty figures, some cooking, others smoking, and all talking or laughing, without thought of rain or any other matter than present enjoyment. Long after the noises ceased I lay and thought of the not far-distant future, where other sounds than these would wake up the silent forest; when the white man would be busy, with his ready instrument, steam, raising the untold wealth which lies buried beneath the surface, and converting the present desolation into a bustling mart of trade.[1]

Such were the thoughts of the pioneer Canadian botanist, John Macoun, camped overnight on the Athabasca River below Fort McMurray 100 years ago. Were he to return now, he would find that the transformation upon which he speculated is well under way. Indeed his very campsite would probably either be in the midst of the

[1] Macoun, J. 1877. "Geological and Topographical Notes on the Lower Peace and Athabasca Rivers," *Geological Survey of Canada, Report of Progress for 1875-76*, Appendix I, Ottawa, 170p.

first major industrial development of the Athabasca Oil Sands, or look across the river to it.

Whether the natural landscape of this area is properly described as a 'desolation' is a very personal, subjective matter. Rain and cold, chilly weather in September doubtlessly influenced Macoun in his remark. The next day, approaching the site of Fort McMurray under a fair sailing wind, he found "the scenery very beautiful and extremely interesting." Other visitors to the area down to the present have replied in equally contradictory fashion to the query, "what manner of land is this?" The toiling boatman tracking a sluggish York boat up the Athabasca Rapids would have a different perspective from the government official observing the valley from the deck of a sternwheeler steamboat. Their views of the nature of the country in turn would be very different from those of the tourist on the hard coach seat of the "Muskeg Special" in the early railroading days, while today's airborne arrival has at once a more comprehensive yet perhaps less informative concept of this same area.

Because of the increasing pressure on resources and the new technological skills, we are better able to report on this "Land of Peter Pond" and to place it in proper perspective. Appreciation of this should assist in making Macoun's 'conversion process' as sympathetic as possible.

The Fort McMurray area lies within the great Interior Plains region of Canada. Only in the extreme northeast of the area does the Precambrian Shield outcrop. Though the resistant granites and gneisses of which it is composed dominate the landscape north of Lake Athabasca and east of the Slave River, they occur only on one small area south of the lake. Elsewhere, this sector of the Shield is composed mainly of sandstones. The western boundary of the Shield extends from the southwest corner of Lake Athabasca southeasterly approximately to where the Clearwater River crosses the Alberta-

Saskatchewan border.[2] To the southwest of this line, much younger sedimentary rocks overlie the Shield, though it can be found at depth.

It is the essentially level-bedded nature of these later formations that provides the foundation for the great sweep of level horizon which marks most of the area. These include deposits of Devonian age (limestones, dolomite, and gypsum) overlying the Shield, and in turn being overlain by Cretaceous sandstones and shales. Salt beds occur within the former group, at depths some 650 feet beneath the surface at Fort McMurray, and have been utilized commercially by wells in the past. Carrigy has noted:

> On the Plains two distinct surfaces can be distinguished: the lower or Second Prairie Level of Saskatchewan and Manitoba covers most of the area and is less than 1,000 feet in elevation. This surface slopes northward and gradually merges into the Canadian Shield in the vicinity of Lake Athabasca. Standing about 1,000 feet above this plain and joined to it by escarpments of moderate slope are the residuals of the High Plains of Alberta–Birch Mountain (to the west of the Athabasca River), Muskeg Mountain (to the east), and Cheecham Hills (or Stony Mountain to the south of Fort McMurray).[3]

Quite similar are the Thickwood Hills west of Fort McMurray. The greatest elevation in the area (2700 feet) is found on Birch Mountain.

These flat-topped tablelands provide the principal irregularity (albeit a very gentle one) in the distant horizon. Given a few more million years of geologic time and they too probably would have been eroded away.

---

[2] Carrigy, M.A. 1959. Geology of the McMurray Formation, Part III: General Geology of the McMurray Area. Research Council of Alberta, Geol. Div., Memoir I, Edmonton, 15p.

[3] *Ibid*, p.7

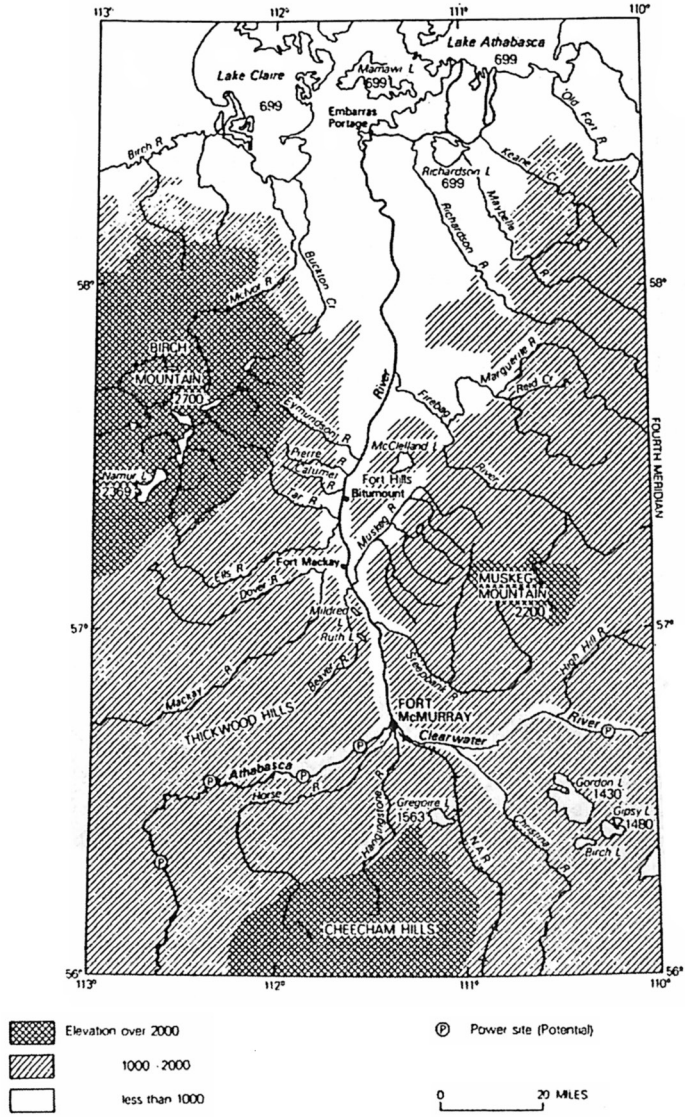


Figure 1: *Topography and drainage of the lower Athabasca River area.*

Over most of the area bedrock is not exposed at the surface (save along some river cut-banks). Instead, the ground is composed of broken materials reflecting the impact of the continental ice sheet which passed over this area from the northwest, some 31,000 years ago.[4] Estimated to have been over a mile thick in this area, the ice and the subsequent melt-water associated with it mantled the underlying bedrock with unconsolidated materials, varying in thickness from a few feet to several hundred feet. Enormous lakes covered almost all this area except the highest uplands,[5] draining south-eastward by various channels into the Churchill and Saskatchewan basins until the Mackenzie Valley outlet was cleared of ice. Even then the water level of the enlarged early Lake Athabasca was much higher than it is at present (700 feet) so that the Athabasca River built up a delta between the mouth of the Muskeg River and the present Lake, the sandy deposits of which lie 100 feet above the present Athabasca River levels.

Most of the water-laid sand deposits which are so widespread though the area have been refashioned by wind in a drier climate than present.[6] The result is an extensive area of varied sand dunes, particularly well marked east of the Athabasca River and south of Lake Athabasca. An interesting feature is that while today's dominant wind direction is from the west-northwest, the orientation of the dunes indicates that at their time of formation it was from the southwest. Most are now fixed by vegetation but there are some areas

---

[4] Bayrock, L.A. 1963. "Surficial Geology", in Lindsay, J.D. et al., *Exploratory Soil Survey of Alberta Map Sheets 74-M, 74-L, 74-E, and 73-L (north half).* Edmonton: Research Council of Alberta, Prelim, Soil Surv. Report 63-1, 61p.

[5] Taylor, R.S. 1960. "Some Pleistocene Lakes of Northern Alberta and Adjacent Areas." J. Alta. Soc. Pet. Geol. 8(6), June: 167-185.

[6] Bayrock, op. Cit., pp. 60-61.

of migrating sand dunes in the area noted and this is one of the most 'ecologically sensitive' sectors within the larger region.

The recency of glaciation and extent of melt-water pondings, together with the general flat-lying nature of most of the area, would lead one to expect lakes. These are most numerous in the Shield area, but there are significant numbers in the Plains area also. Most are relatively shallow, marking their transitory nature in the process of landscape evolution. Indeed, it is the very large areas of silted-in lakes with associated distinctive organic deposits, muskeg, or peat bog, which characterize much of the area. A recent estimate reports they "cover surficial deposits to depths of one to tens of feet over 60 to 75 percent of the region."[7]

The drainage pattern of today has been described by Carrigy:

> In Tp. 87, R. 17 (W. 4th) the northward-flowing Athabasca River makes a right angle turn and flows eastward as far as McMurray where it is joined by a major tributary from the east, the Clearwater River. From McMurray it once again follows a northerly course through the McMurray area to Lake Athabasca. The tributaries of the Athabasca and Clearwater Rivers have their headwaters in the highland areas previously mentioned.... This drainage system has been incised into the upland plain and the rivers now occupy deep trench-like valleys.
>
> The major valley system of the area has a broad U-shaped cross-section and straight parallel walls free of spurs. At McMurray it is one mile wide and 250 feet deep. It rounds westward from the Saskatchewan border along the 23rd base line and is occupied by the Clearwater River as far as McMurray where it turns northward. This north-trending section is occupied by the

---

[7] Hamilton, W.N., and G.B. Mellon. 1974. "Industrial mineral resources of the Fort McMurray Area," in Carrigy, M.A. and J.W. Kramers, eds., *Guide to the Athabasca Oil Sands Area.* Edmonton: Research Council of Alberta, Information Series 65, 130p.

> Athabasca River which breaks into the valley at McMurray (after cutting through the Thickwood Hills to the southwest). The tributary stream valleys are V-shaped and river terraces are narrow and discontinuous.[8]

Over the 180 miles of its course above McMurray, the Athabasca River drops more than 800 feet in elevation. Along this course, part of which is a comparatively recent post-glacial feature, rapids occur at several places, where ledges of sedimentary bedrock or accumulations of boulders are encountered. Some bear such intriguing names as *Rapides du Joli Fou*, others are more prosaic, such as 'Long Rapids.' Largest of all, the Grand Rapids, with a fall of approximately 30 feet, occurs some fifteen miles above the point

Manner of making a resting place on a winter's night. Drawn by Lieut. Back, R.N., March 15th, 1820.

[8]Carrigy, op. Cit., pp.7-9.

where the Athabasca makes its pronounced bend toward the east. These latter rapids are divided by a narrow wooded island upon which in times past the Hudson's Bay Company erected a wooden tramway to facilitate portage around them.

Since 1910, the rapids have been studied periodically as a potential source of hydro-electric power, though as yet there has been

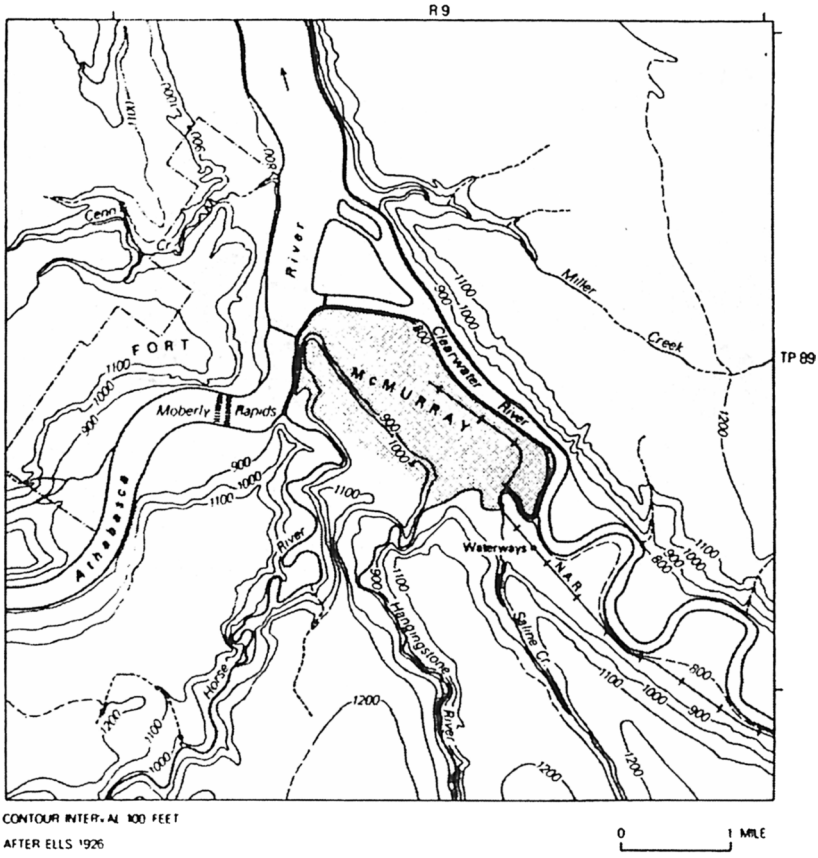


Figure 2. *Contour map at junction of Athabasca and Clearwater rivers.*

no utilization for this purpose. Along this 180-mile portion of its course it has been estimated that there is a potential total installed turbine capacity of 1.6 million horse power.[9]

As noted previously, at the site of Fort McMurray the Clearwater joins the Athabasca River from the east. The former river here is a smoothly flowing stream about 400 to 500 feet across, meandering across a flat flood-plain floor approximately a mile in width. One large island and a smaller one occupy the mouth of the Clearwater with the main navigation channel being the northernmost. The southernmost is termed the Snye–a word frequently encountered amongst the river settlements of the Mackenzie. It is believed to have originated as an English corruption of the French *chenal.* This particular channel has recently been sealed off from the Athabasca by an earth fill tying the island to the mainland on the south. Immediately above the junction the present channel of the Clearwater is adjacent the steep 250-foot rise of the northern valley wall which, together with that on the south, sharply defines the site of Fort McMurray. In the past at least the site has been flooded, to which ice jams on the Athabasca have contributed.

The last of the rapids on the Athabasca (Moberly Rapids) occurs only a little over a mile above the union. At the latter point, the Athabasca River is about 1000 feet across, widening out to almost double that downstream. It flows at an average rate of about three miles an hour. No serious obstruction to navigation exists over the final 175 miles to Lake Athabasca, though islands and sandbars are numerous, with shifting channels. These are particularly complex in the delta (beginning at 'The Willows') and this sector and others at times of low water are demanding of the rivermen's skills for modern vessels. Operating depths are "as little as 3 feet in the delta, where

[9] 1958. *Report of Royal Commission on Development of Northern Alberta.* Edmonton: Queen's Printer, 64p.

even lower water often occurs in the autumn."[10] Navigation season northbound from McMurray generally begins from the end of the first week of May to the end of the month, and terminates in mid-October with freeze-up.[11] Close-off date for northbound freight from McMurray to Lake Athabasca points ordinarily is in late September.

Climatically the Fort McMurray area is included generally with the forest and parkland areas of central Alberta and Saskatchewan rather than with the Mackenzie Basin proper.[12] At the same time, conditions are rather more severe than those prevailing in the Edmonton or Peace River areas,[13] falling within the Koppen Dc (Cold, snowy) climatic type with a shorter summer than the other two areas mentioned (Db zone). It will be noted that rather more severe winter temperatures are experienced in Fort McMurray than in Edmonton or Grande Prairie, but that summer temperatures are approximately the same, being moderate to light overall, though generally falling off to the north. Snowfall is only about half the amount experienced by Toronto or Montreal, but it does tend to last. The shorter frost-free season at McMurray is noticeable. However, the effect of local relief is very important in micro-climate and this is

---

[10] Robinson, J.L. 1945. "Water transportation in the Canadian Northwest." *Canadian Geog.* J. XXX-I(11), November, 241p.

[11] 1967. *Great Slave Lake and Mackenzie River Pilot* (2nd ed.). Marine Sciences, Cdn. Hydrographic Services, Dept. of E., M., & R. Ottawa: Queen's Printer, 25p.

[12] Kendrew, W.G., and B.W. Currie. 1955. *The Climate of Central Canada.* Ottawa: Queen's Printer, pp. 121-147.

[13] Longley, R.W. 1972. *The Climate of the Prairie Provinces*, Climatological Studies No. 13, Atmospheric Environment, Environment Canada, Information Canada, Ottawa.

Table 1: Selected Climatological Data

	STATIONS				
	Fort McMurray	Edmonton	Grande Prairie	Fort Vermilion	Uranium City
Elevation	1213	2219	2190	915	1024
Temperature (°F)					
Mean Annual	31.0	36.9	34.9	29.1	26.0
Mean Daily Maximum					
January	3.8	15.2	12.1	0.0	-6.7
April	47.8	50.0	47.0	44.8	34.0
July	75.5	74.4	71.8	74.7	71.3
October	47.2	51.6	48.3	43.9	40.8
Mean daily Minimum					
January	-16.4	-2.0	-5.9	-18.9	-24.1
April	21.7	28.9	27.0	21.4	12.8
July	47.7	51.7	48.8	48.6	52.6
October	26.2	30.7	27.9	24.5	27.7
Extreme Low	-59	-57	-62	-78	-55
Extreme High	96	99	94	103	91
Mean Dates of Frost					
Last in Spring	June 19	May 18	May 21	June 6	–
First in Fall	Aug. 19	Sept. 19	Sept. 7	Aug. 22	–
Effective Growing Season Average Dates					
Last in Spring	May 1	Apr. 26	May 1	April 27	–
First in Fall	Sept. 29	Oct. 7	Oct. 5	Sept. 29	–
Annual Growing Degree-Day Normals	2154	2596	2205	2320	--
Precipitation (inches)					
Mean Annual Total	16.85	18.64	17.27	13.92	14.10
Mean Annual Snowfall	50.0	53.8	65.5	50.9	55.2

Source: *R.W. Longley*

probably a factor in the case of McMurray. The strongly incised valleys play a major role, with cold air for example, tending to collect in the valley bottoms. As industrial development increases in the McMurray area, such features as ice-haze in winter can be expected to increase in the valleys during periods of prevailing cold stable winter air.

The Fort McMurray area generally falls within the boreal forest region,[14] dominated by white and black spruce (*Picea glauca*, and *P. mariana*). Less common or more local species include jackpine (*Pinus banksiana*), lodgepole pine (*Pinus contorta*), balsam fir (*Abies balsamea*), and larch/tamarack (*Larix laricina*). There also are admixtures of trembling aspen (*Populus tremuloides*), balsam poplar (*P. balsamifera*), and white birch (*Betula papyrifera*) over much of the area.

Raup[15] has set out the broad features of the natural vegetation of the area. Overall, the general upland surface underlain by the sedimentary deposits is dominated by the white spruce forests. However, two conditions have restricted the area of climax forest: the imperfect drainage of much of the area, and the extensive effects of fire. Reference has been made to the widespread distribution of muskeg. This consists of thick mats of mosses (e.g., *Sphagnum*) and bog shrubs such as Labrador tea (*Ledum groenlandicum*), with stunted stands of black spruce and at times larch. The largest trees rarely exceed thirty to fifty feet. Ice and frozen conditions have been reported frequently at depths of nineteen to thirty-six inches from the

[14] Rowe, J.S. 1972. *Forest Regions of Canada.* Canadian Forestry Service, Department of Environment. Ottawa: Information Canada.

[15] Raup, H.M. 1946. "Phytogeographic studies in the Athabasca-Great Slave Lake region II." *J. Arn. Arbor.*, XXVII(1) January: 1-84.

surface in muskeg areas throughout the area.[16] No geographical pattern appears to occur from information to date. From the earliest days, observers have commented also upon the widespread incidence of fire through the upland sectors. In such sectors jackpine, aspen, and balsam poplar are frequently encountered, with jackpine particularly noticeable upon sandy spoils. Aspen overall, however, is the cover type of greatest areal extent. The other sector where jackpine forests dominate is upon the Precambrian Shield area south of Lake Athabasca.

Table 2. Timber Production for All Species in the Athabasca Forest (Vol. in Thousands of cu. ft.)

Fiscal Year	Total Timber Production
1960-61	367
61-62	565
62-63	348
63-64	154
64-65	188
65-66	118
66-67	123
67-68	1060
68-69	807
69-70	2923
70-71	2634
71-72	2046
72-73	2265

Source: *Alberta Department of Lands & Forests*

It is upon the flood plains and valley slopes of Athabasca and Clearwater Rivers that the most valuable forest stands occur, dominated by the white spruce and balsam fir. Ascending the

[16] Lindsay, J.D. *et al.* 1963. *Exploratory Soil Survey of Alberta Map Sheets 74-M, 74-L, 74-E, and 73-L (north half)*, Research Council of Alberta, Prelim. Soil Surv. Report 63-1, Edmonton, 16p.

Athabasca, Macoun noted: "At Embarras River, and a few miles north of it, the spruce is of an enormous size, many of them being over three feet in diameter and very tall."[17]

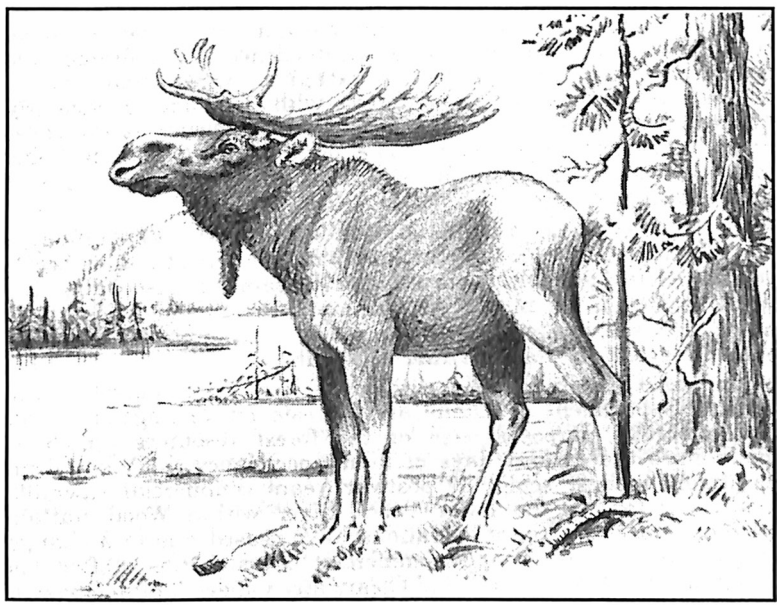
The area generally falls within the Athabasca Forest of the Department of Lands and Forests for management and administrative purposes. Use of the forest resources has been made since the earliest days of man's occupancy, but on a comparatively modest scale. In postwar years, commercial sawmills have operated on the lower Peace River within Wood Buffalo National Park, but these operations have ceased due to a change in Park policy. One major commercial operator has shifted his attention to the Athabasca and Clearwater valleys, and increasing general economic development in the area will doubtlessly be reflected in still further expansion of the local forest industry. Some indication of local production is provided in Table 2.

> Early visitors were generally favourably impressed with the agricultural potential of the area, viewing it as they were from the river valleys. Approaching Fort McMurray from the north by way of the Athabasca, Macoun reported, "Both sides are well suited for agriculture, and evidently the soil of the whole country for fully fifty miles below the forks, on both sides of the river, is very good. And all the botanical observations confirm this view."[18] At Fort McMurray on September 9, 1875, he noted: "The first frost of the season occurred last night, and killed cucumber vines, pole beans, potatoes, and all the tender vegetables in the gardens. Mr. Moberly (in charge of the H.B.C. post) told me his wheat and barley were superb, and that the country around the fork was well suited for farming purposes. My own observations agree with this statement, but I had less

[17] Macoun, *op. cit.*, p. 168.

[18] *Ibid.*, p. 170

means of knowing than he had. About a mile above the fork, on the left bank of the Clearwater, is a beautiful prairie, upon which Mr. Moberly had cut a great quantity of hay with a reaper. This prairie only waits the plough to become a farm of great value. The Hudson (sic) Bay Company, if so minded, could raise enough wheat here to supply the demands of the whole north, instead of bringing it all the way from Manitoba. About two miles above the prairie, a small river (Hangingstone Creek) flows in from the same side, and, as it descends from high ground, would probably afford a mill site.[19]



Moose (E.W. Rowan), University of Alberta Archives.

[19] *Ibid,* p. 171.

Certainly, vegetable gardens have and do produce impressive showings. Yet without denying the favourable conditions which may exist locally, particularly on rich river-bottom alluvium and where micro-climate may be encouraging, no significant agricultural development has occurred within the area over the hundred years since Macoun's account.

Modern exploratory soil surveys have not reported encouragingly on agricultural prospects for the area.[20] Where mature soils are developed, they are almost always podzols or grey wooded soils which must be handled skilfully for successful farming. In fact, as has been noted, many factors do not permit normal mature soil development, e.g., muskeg. The net result is that the Alberta Soil Survey in its land rating classification has not seen fit to include any significant part of the area in its 'arable' or even 'doubtful' categories. All is classified as 'pasture or woodland': those areas "considered unsuitable for agricultural development for reasons of poor soil, excessive stoniness, rough topography, or some other associated feature."

If any one feature must be singled out to give distinctiveness to the Fort McMurray area, it must be the oil sands (sometimes also called 'tar sands'). The oil-impregnated sands which are exposed along the river banks have been remarked upon by every traveller who has passed through the area. The Indian inhabitants early discovered the first practical use for them—to provide a caulking substance for their bark canoes, a practice which continued to be followed by later fur trade parties in canoes and boats. Over the years, many have puzzled their origin and speculated upon the rich potential resource they provided. The account of the prolonged and frustrating search for the conversion of the oil sands from a

---

[20]Lindsay, J.D., P.K. Haringa, S. Pawluk, and W. Odynsky. 1958. *Exploratory Soil Survey of Alberta Map Sheets 84-C (east half), 84-B, 84-A, and 74-D.* Research Council of Alberta, Prelim. Soil Surv. Report 58-1, Edmonton. See also Lindsay, *op. cit.*, 1963.

'potential' to an actual resource will be detailed elsewhere. A brief introduction to the oil sands in their natural occurrence would seem in order at this point, however.

The oil involved is a very heavy, asphaltic-type crude oil (hence 'tar sands') but on processing produces a fluid oil little different from petroleum obtained from oil wells. It occurs in unconsolidated sands of Cretaceous age which lie atop Devonian limestones. Above the oil-bearing sands in turn there may be sandy and clayey surface layers of glacial or postglacial origin which may be only a few feet or as much as two thousand feet in thickness. The Athabasca River has cut its course through the heart of the oil sands where the surface cover is thinnest. The oil sands thus are exposed "along the Athabasca River valley and its tributaries in northeastern Alberta between latitudes 56° 30' and 58° North, (i.e., from above Fort McMurray for about sixty miles downstream from the Clearwater junction), and between the Saskatchewan-Alberta boundary and 112° West longitude. The extent of the oil-impregnated sand in the subsurface is incompletely delimited, but it appears to extend over an area of 20,700 square miles bounded by latitudes 55° and 58° North between the Fourth and Fifth Meridians."[21] The actual extent may be further increased when more detailed knowledge is available. In any event, the deposit clearly contains an immense quantity of oil with estimates common of over 600 billion barrels in place—it is often described as the largest known reservoir in the world!

The mystery of how the oil came to be in the sands is still not solved. Most theories fall "in one of two categories: firstly, those which postulate that the oil originated in older strata (of the Devonian) with migration and accumulation taking place (in the sands) after the formation of a suitable trap, and secondly, those which postulate that the oil was deposited at the same time as the

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[21] Carrigy, M.A., and W.J. Zamira, 1960. "The Athabasca Oil Sands," in *Oil Fields of Alberta.* Calgary: Alberta Soc. Pet. Geol., p 39.

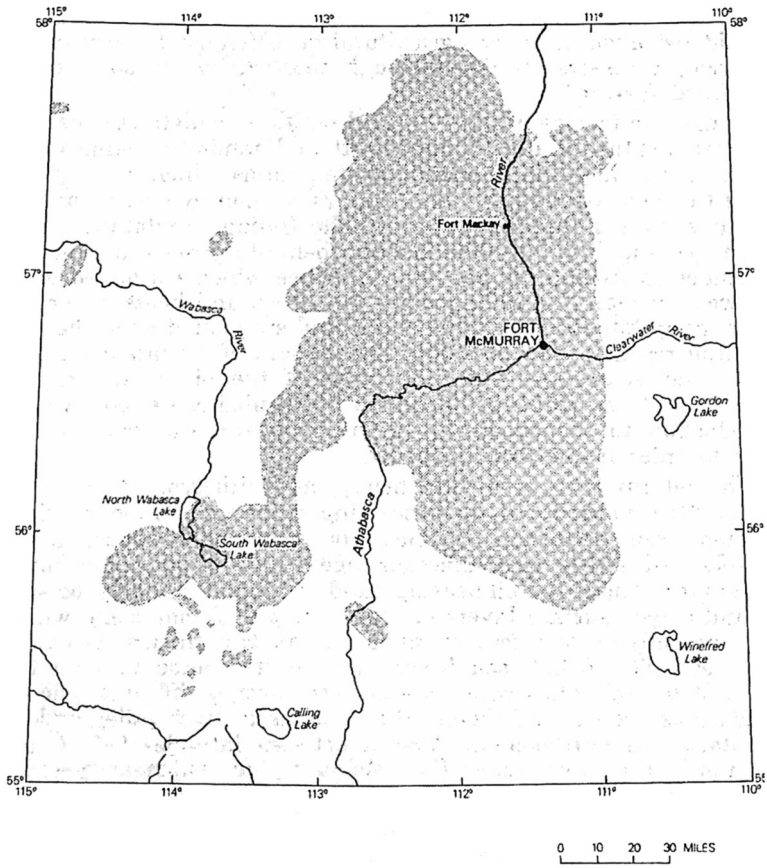

Figure 3. *Limits of the Athabasca Oil Sands.*

sands or was derived from contiguous shales of the Clearwater and Loon River formations."[22] The Clearwater formation (chiefly shale) which originally overlay the oil sands has been largely eroded away in the exposed oil sands area.

A quarter of a century ago, Dr. Karl A. Clark, whose professional career at the University of Alberta and Research Council of Alberta was dedicated to solving the technological challenge of the oil sands, wrote of them:

> Amid all this activity the bituminous sand deposit remains virtually untouched. The seamed cliffs on the Athabasca carry a smirk on their faces, and no one who visits the Northland can miss its meaning. It says plainly: "You are doing big things with everything else in this North country, but I have still got you beat. When are you going to do something about it?"[23]

No one would be more delighted than he to at last hear the firm reply, "Now!"

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[22] *Loc. Cit.*

[23] Clark, K.A. 1949. "The Athabasca Tar Sands." *Scientific American*, 180(5) May: p. 53.

Chapter Two

Moose and Muskeg, Birch and Beaver

Natural Environment and Wildlife

P.D. Lulman

The trials and tribulations undergone by Peter Pond and subsequent explorers in the Athabasca basin are perhaps incomprehensible to ourselves. But the lure of unknown country harbouring an inestimable wealth of animal pelts was too great for these men with adventure in their blood.

In the course of their travels, they were to be continuously grateful to numerous species of plants which supplied wood for shelter, bark for canoes, resin for caulking canoe seams, and of course, cover for the wildlife hunted by the Indian and prized by the fur traders.

The Athabasca River flows from the Rocky Mountains through the foothills region, heading north and east. The river winds its way through dark pine and spruce forest, occasionally breaking into light airy aspen forests or grassland growing in the better drained locations. Close to Lac La Biche, the Athabasca River turns north, plunging into the boreal forest. This vegetation region of North America, also called taiga, possesses similar characteristics from Newfoundland to Alaska. Wherever land is able to support trees, coniferous or needle-leaved species are the most common. Over much of the boreal region the land surface, covered by a thin mantle

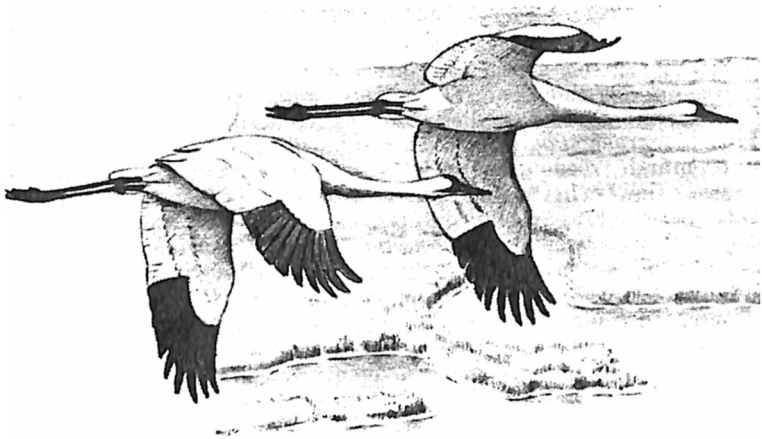
of young soil deposited by the last glaciers, is pitted and strewn with lakes.

A short growing season, with bitter winters, restricts the stature of all the plants, unless they grow favourable, sheltered spots. With great accumulations of surface water on poorly drained soil, mosses and sedges grow in profusion. This vegetation forms bogs, called 'muskeg' in Ojibway, composed of decaying mosses, sedges, and rushes, and covers large areas of this country.

In the Fort McMurray region, only four to six inches of the 15-20 inches precipitation which falls each year is contributed by snowfall. This snow is dry, powdery, and exhausting to break trail through. However, the snow blanket acts as a most efficient insulator protecting subnivean animals and plants. Lakes, covered by the snow, freeze over only on the surface. As the lakes are normally shallow—ten feet of water or less—the snow is the only protection for fish that would be winter killed were the water surface to be clear and windswept.

The boreal forest in Alberta is dominated by coniferous needle-leaved trees: white and black spruce (*Picea glauca*, and *P. mariana*), larch (*Larix laricina*) and jackpine (*Pinus banksiana*). Aspen poplar (*Populus tremuloides*) and paper birch (*Betula papirifera*) are often found as small groves interspersed with the conifers. Each of these tree species is dominant in particular locations or habitats depending upon available water, soil

Beaver. Alaska Journal.

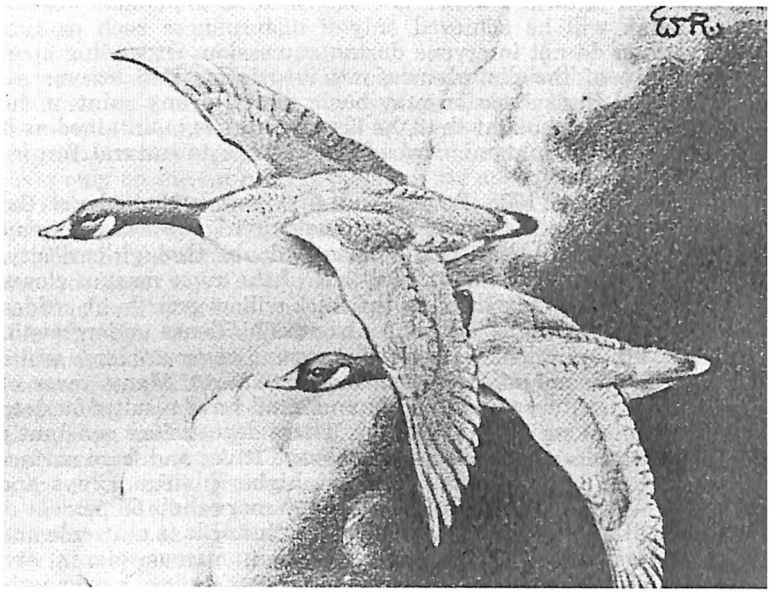


Whooping crane (E.W. Rowan). University of Alberta Archives.

type, slope aspect, and steepness, and the amount of rainfall. For many thousands of acres no trees grow at all due to waterlogged conditions, but willow (*Salix* spp.) scrub often manages to survive.

Under the trees grow a profusion of plants of all sizes from tall shrubs such as low-bush cranberry (*Vibernum edule*), choke cherry (*Prunus virginiana*), and red osier dogwood (*Cornus stolonifera*); to herbs such as wild vetch (*Vicia americana*), horsetails (*Equisetum* spp.), and white flowered grass-of-Parnassus (*Parnassia palustris*); to the smallest mosses, like *Rytidiadelphus triquestris*. At any given location, with its particular physical conditions, the first vegetation to become established is succeeded by other combinations of plant species. Eventually, a complex of plants growing together in a natural balance is established as the climax vegetation. Climax will be achieved only if disturbances such as fire, flood, or man do not intervene during succession. Depending upon the intensity of the disturbance, new vegetation will become established and the succession may begin again at any point in the progression. It is thought that the boreal forest is maintained as a mosaic of conifer and mixedwood, mainly due to natural fire interruption succession.

In the year of 1778 Peter Pond first saw and explored the Athabasca River. At this time he must have gone ashore many times, both out of necessity and without doubt, through curiosity. As he steps ashore, the thick oozy silt of the river margin closes over his boots. Pushing through the thick willow growth, he strides up a short steep incline and is confronted by dense undergrowth. Standing tall and imposing above the ground cover are large white spruce and balsam poplar (*Populus balsamifera*). Many years of river erosion and deposition of silt and sand have resulted in deep rich alluvium along the river valley. These deposits are constantly supplied with moisture



Canada Goose (E.W. Rowan). University of Alberta Archives.

from the Athabasca River and from surface drainage running as streams from the higher plateau. Clays and silts, both fine grained materials, make up more than 60 percent of the total soil material. This type of soil, rich in plant nutrients and moisture, provides an

ideal habitat for numerous plants and animals. During spring snow melt, horsetails, particularly *Equisetum arvense*, spring up to cover the ground in a growth of brown, fertile stems. Once the spores are mature and dispersed by the wind, the vegetative stems grow up green and frond-like. It is these first green stems that are coveted by the browsing moose (*Alces alces*) and deer (*Odocoileus* spp.). As spring passes into summer, the *Equisetum* dies out to be replaced by grasses, including fowl bluegrass (*Poa palustris*), hairy wild rye (*Elymus innovatus*), and marsh reed grass (*Calamagrostis canadensis*). After the grasses flower, herbs—such as twin flower (*Linnea borealis*), wild strawberry (*Fragaria virginiana*), bastard toad flax (*Geocaulon lividum*), and fireweed (*Epilobiumangustifolium*)—leaf out quickly to take advantage of the bright sunlight before the shrubs and deciduous trees (birch and poplar) produce leaves, shading the ground. In midsummer, moose and deer move away from the river valley into the forests and muskeg of the plateau. This movement occurs primarily because the plateau provides more available forage over a greater area and fewer irritating biting flies than the river valley.

Mosquitoes in black clouds soon swarm all around Pond. Pushing on through the red osier dogwood, willow, alder (*Alnus acicularis*), he tramples luxuriant herbs beneath his feet. Sweet scented honeysuckle (*Sambucus involucrata*) assails his nostrils—as do the mosquitoes—and he disturbs a downy woodpecker (*Dendricopos pubescens*) flitting from tree to tree picking insects from the bark. The ill-defined trail is blocked by a large weed-clogged lake rich in beaver (*Castor canadensis*), judging by the lodges. The trekker turns around and makes back to his canoe. To his joy he sees a flock of five Canada geese (*Branta canadensis*) land near the river bank. Cautiously making for good cover, Pond takes aim and has a fat goose for the pot that night.

Back on the river, the trapper drifts gently with the stream, paddling occasionally to avoid submerged sand bars. Some of these sand bars are elevated three or more feet above the river level and support a stabilizing growth of red-stemmed willows (*Salix glauca*).

Returning to these islands in the midst of winter, moose would be encountered frequently browsing on willow stem, their favourite winter shrub.

The following day dawns bright above the river valley, but with a heavy dew on the ground. Seen from the plateau above, a dense, moist mist coils and writhes in the valley below. Except where tributary streams to the Athabasca disgorge into the river valley, access to the higher plateau regions is restricted to steep animal trails up the valley escarpment face. Pond steps ashore into the river breaks willow community, through a narrow spruce-poplar stand and up the scarp slope. He stops on the slope to look at a small outcrop of black-grey shale over which bitumen is glistening. No plants can grow on this raw material. All around the bare patch of bitumen-soaked shale grow understory herbs including peavine (*Lathyrus ochroleucra*), coltsfoot (*Petasites palmatus*), and pussytoes (*Antennaria dioica*). Paper birch, jackpine, and white spruce share the space available for trees. The bank is a mosaic of river valley and plateau vegetation, with plants representative of all habitat types from the driest to the most moist. Animal usage of the slope areas is minimal; they serve mainly as a means of moving back and forth between the river and the upper plateau. An occasional spruce grouse *(Canachites canadensis*) enters into the area to forage for berries and seeds.

On top of the plateau, Pond enters a mixed forest of spruce and aspen. Where the aspen is most common, with only a few young spruce growing in the shade, it is plain from the blackened standing tree trunks that fire swept through only 15 to 20 years ago. Deeper in the forest, large white spruce tower above the dwindling, spindly aspen. Succession has almost reached the climax forest condition. Penetrating the forest undergrowth is hard going, with the tangled wind-blown burnt trunks lying under a wild profusion of peavine, rose, saskatoon (*Amelanchier alnifolia*) and northern bedstraw (*Galium boreale*). Where aspen is growing, the soil is moist but well drained. The leaves contribute to a shallow moisture-retaining organic layer on the soil surface. Unlike soils under pure coniferous forest, aspen

grows upon alkaline, lime-rich soils. The grass and herb vegetation is rich and diverse, with some plants peculiar to the community. These include bluebells (*Mertensia paniculata*), asters (*Aster* spp.), goldenrod (*Solidago* spp.), wild lily (*Lilium philadelphicum*), and geranium (*Geranium bicknellii*). Most of the shrubs, including choke cherry, rose, low-bush cranberry, and saskatoon are common to the aspen and aspen-spruce mixedwood forests. Moose and deer frequent the mixedwood and aspen, chewing on the aspen bark and browsing the succulent buds on the shrubs. The pileated woodpecker (*Dryocopus pileatus*), an uncommon bird, pecks insects from rough reams of bark on trees. The Canada jay (*Perisoreum canadensis*) is frequently found where there is human activity, flitting softly from branch to branch. The black-capped chickadee (*Parus atricapillus*), swooping in flocks through the aspen drowns, is not as conspicuous in summer as in winter when he is one of the few residents. The boreal chikadee (*Parus hidsonicus*), a close relative of the black-capped chickadee, remains high up in the coniferous trees during winter and hence is less frequently seen. An occasional black bear (*Ursus americanus*) may amble through the aspen mixedwood en route to a dry, sandy jackpine ridge where berries grow in profusion.

The trapper wanders through the spruce–aspen mixedwood. An open area appears ahead where a mighty white spruce has been laid to rot by the work of storm and wind. Many aspen saplings are springing up from the interconnected network of aspen roots, stimulated to sprout by increased soil warmth and the disturbance to the topsoil by the toppled white spruce. Amongst the aspen saplings, a profusion of raspberry (*Rubus* spp.) canes are heavy with red, juicy fruit. These attract bears, and evidence of their activity is obvious in the broken raspberry canes and overturned rocks where they have also looked for ant nests. Beyond the open glade the aspen forest continues some distance, then is abruptly cut short. A long wide ridge of yellow sand with large rocks interspersed, a remnant of the glacier's load 10,000 years ago, proves too dry for aspen and spruce. Only the hardy jackpine can survive on such dry, nutrient-poor sands.

The top two or three inches contain most of the nitrogen, potassium and phosphorus; below this the sand is bleached and ashen grey in colour. Extensive mats of 'reindeer moss,' really a *Cladonia* lichen, crunch underfoot during the dry summer season. Bearberry or *kinnikinick* (*Arctostaphylos uva-ursi*), with its shallow roots in the top veneer of 'soil' is the only other prominent plant cover. Reproduction of bearberry is vegetative; the outward growth of prostate leaf-covered woody stems gives rise to roots at intervals. The bright red berries attract spruce grouse and bears. Here and there are large bluish-red patches of bear excrement, the remainder of partially digested, hastily gorged raspberries and blueberries. Bears, wide ranging animals with road territories, feed mainly on vegetable matter, but occasionally on insects and small rodents.

Bison (E.W. Rowan). University of Alberta Archives.

On the other side of the mixedwood forest, Pond arrives at a boggy depression in the land, thick with black spruce. The trees are short and narrow stemmed, and if Pond were to have cut one down and counted the growth rings, he would have found more than one hundred year's growth. For a tree to be four or six inches in diameter at the base of the stem and this old gives some indication of the poor soil–waterlogged and with little aeration. The only plants able to grow

beneath the trees in continual semi-darkness are the grey-green feather mosses such as, *Hylacomium splendens* and *Ptilium crista-castrensis*, the liverwort *Plagionmium orthorhynchium*, lichens, and an occasional clump of white flowered grass-of-Parnassus. In spring and fall the mushroom *Lactarius speciosus*, with a green-orange cap covered in a sugary fluid, pushes through the mosses. The black bear will often resort to the dense, black spruce forest in the fall to hibernate where the snow falls deep and insulates the animal from winter cold.

Mallards (E.W. Rowan). University of Alberta Archives.

The black spruce loads to even wetter ground, where open water is visible between the low hummocks. Sedges, particularly *Carex* and cotton grass

(*Eriophorum angustifolium*) grow readily in this type of terrain. Willow shrubs grow on the perimeters of the wettest areas and along stream banks. In summer, some ducks and geese may venture into the wet, swampy areas, and sandhill cranes (*Grus canadensis*) may land there for a time to feed on frogs and snails, or build nests during the breeding period. During winter, willow ptarmigan (*Lagopus, lagopus*), feeding on the willow buds, leave a criss-crossed mass of trails in the snow. Carex sedge, growing in the expanse of stagnated open water, is not an inviting location to wander. Near the margins of the sedge meadow, numerous tamarack or larch trees (*Larix laricina*), inured to living in near-saturated soils, grow above a moss-sedge, hummocky landscape. Distinguishable by their feathery tufts of light green needles, larch are the only coniferous trees to shed their needles in the fall. At this time of year the brilliant yellow-reds add a spot of color to the sombre greens and browns of the boreal forest. A lone raven (*Corvus corax*), feathers glistening black in the sun, lands in the crown of a tall larch and croaks at the intrusion of a human into the land.

Making his way back to the jackpine ridge, Pond passes aspen trees, visibly green on the north side and the south aspect powdery white. This provides an excellent means of orienting the trapper in the bush. The grey powder is actually a wax secreted by the tree to reflect intense rays of sunlight at the height of summer. The aspen bark is photosynthetic and easily damaged by strong radiation.

After a bite of lunch—smoked moose meat and some raspberries and blueberries from around his stopping place—the explorer makes his way back to the Athabasca River, keeping the higher sandy ridges as far as possible. On the way back he comes to a winding, slow-flowing stream; brown as the colour of strong tea. The stain, leached from the surface peats of the muskeg, impact no more than an earthly taste to the sweet, cold water. Water movement is impeded by numerous beaver dams down the length of the stream channel. Surely good fur country! In the lower reaches, where the streams meet before draining into the Athabasca River, gravel on the

stream bed provides excellent spawning grounds for grayling (*Thymallus arcticus*).

After hours of treading the dry ground of the jackpine and aspen-spruce forests as well as the wet country where black spruce grows, Pond arrives back at the Athabasca. The aspect down the river is one of fully mature forests. This could be misinterpreted as the forest covering all this area. As Pond saw, once away from the deep, rich soils of the river flats, much of the plateau land is almost devoid of trees. Poorly drained sedge moors and stunted black spruce cover much of the land area; where dissected by gravel and sand ridges, a sparse cover of jackpine occurs. The moist soils support aspen and spruce.

Dropping into his canoe he pushes off from the muddy bank and gains the swifter water which will carry him north to Lake Athabasca. He will pass through another 150 miles of boreal forest before reaching the lake. Many an outcrop of the yellowed limestone above which sits the tar sand will slip by, and the occasional black slopes of tar sand loom up on either side. But many decades are to pass before human pressure changes the face of this land through fire, clearing, and the search for the black gold.

Chapter Three

People of the Boreal Forest

Chipewyan and Cree

Hugh A. Dempsey

The Woodland Cree

The Cree are one of the largest tribes in Canada, extending from Hudson Bay to the base of the Rocky Mountains. They are divided into four basic groups: the Plains Cree, Woods Cree, Swampy Cree and Moose Cree. Of these, two of the groups are found in Alberta, the Plains Cree in the central part of the province, and the Woods Cree in the North. The Swampy Cree are mostly in northern Manitoba, while the Moose Cree occupy the area near Moose Factory on Hudson Bay.

The Crees are of Algonkian linguistic stock and each of the four divisions has a slight variation in dialect. Most marked is the use of the letter 'y' by the Plains Cree in some words (for example, 'I know it', *nikisk-ay-itayn*) where the Woods Cree use 'th' (*nikisk-iyth-itin*), the Swampy Cree and 'n' (*nikisk-ayn-itayn*), and the Moose Cree an 'l'(*nikisk-ayl-itayn*).

In their own language they were called *Nahiawuk*, sometimes translated as 'exact people,' while early explorers referred to them as *Kristineaux*, which is based upon an Ojibwa term for the tribe.

The Woodland Cree were among the first tribes to meet British traders on Hudson Bay in the 1600s. At that time their native hunting

grounds extended only as far west as the present Alberta-Saskatchewan boundary, with the Beaver Indians inhabiting northern Alberta.

The Crees soon profited from the knives, guns and utensils which were available from the traders in exchange for furs. Not only did they begin to concentrate on trapping, but they also became middlemen, trading the metal objects to tribes farther west.

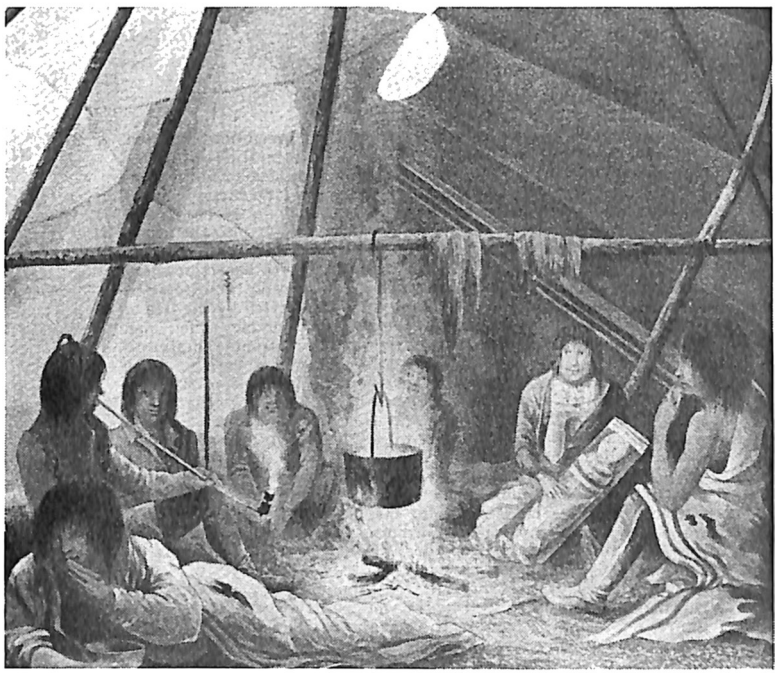
Within a few years, the hunting area of the Woodland Cree was being heavily trapped, so the tribe began to push south and west. A fur trader, Andrew Graham, writing the late 1700s, observed: "Either to avoid Europeans, or in order to search for furs to barter, or because food grew scarce by the large numbers of animals destroyed for their furs and skins, one or more of these reasons has caused them gradually to retire farther inland..."

Others remained close to the traders, living both by trapping and by providing fresh meat to the posts. These people were known as the 'Home Guard' Indians, while those farther away were called Southard Indians (because their hunting grounds were southward from Hudson Bay). "The nation is very numerous and divided into many tribes," said Graham. "A very small portion come down to trade at York and Churchill settlements... With [their] skins they come down annually to the settlements, and as only so small a number as two hundred small canoes undertake the voyage, the others who remain inland send their goods with any of their acquaintance."

Within a short time, the Woodland Cree had pushed the Beaver Indians back to the upper waters of Peace River and occupied much of the central and northern portion of Alberta. By the early 1800s, the Woodland Cree were in control of the vast forest belt of the Canadian west and were following the traders into the more northerly regions.

During their period of recorded history, the fate of the Woodland Cree was closely intertwined with the fur traders. Their annual wanderings centered upon the forts, and by the early 1800s

many had abandoned important aspects of their own culture and dress in favour of European ways. Many fur traders married Woodland Cree women and a group known as Metis or half-bred came into being. Some Metis were hunters and trappers like their mother's people, but others received a good education and entered the service of the Hudson's Bay or North-West Company as clerks or traders. Such surnames as Cardinal, Pelletier, Cunningham, McGillis, Martel, and Sutherland became common among the native population.



Interior of a Cree lodge (Robert Hood). Glenbow-Alberta Foundation.

The Woodland Cree lived primarily off the moose, deer, elk, smaller animals and fish. As the animals tended to travel singly or in small herds, the Indians, too, remained in small groups. Often they remained in family units, meeting other members of the tribe only for ceremonies or visits to the trading posts. Unlike their brothers on the Plains, who travelled in large bands, the woodland people did not maintain a strong tribal identity, nor did they develop a complex structure of societies and religious fraternities which were so common to the plains.

But perhaps even more than the Plains Cree, the woodland people were deeply religious. Because families lived lonely and isolated lives, they were keenly aware of the fine line between survival and starvation. If the moose could not be found; if the rabbit population reached its low cycle; or if winter storms kept the people huddled in their lodges, their scanty food supply could quickly run out. For that reason, supernatural help was important to the Woodland Cree; the forests were filled with evil spirits which could kill, maim, or deform the luckless hunter. One of these spirits was the *Witigo*, a great cannibal monster with a heart of ice which roamed the woods and fed upon the unwary. A spirit of the *Witigo* could also enter the body of a person, turning him into a cannibal who had to be killed by his relatives.

Another spirit of the forest was the *Pakakos*, which was a skeleton spectre which could fly through the air and attack a hunter. The Cree believed that this spectre preyed upon poor hunters—men who wounded animals and let them escape or killed unnecessarily. When the *Pakakos* attacked such men, it could paralyse their arms or otherwise make them incapable of further hunting.

There were also sorcerers among the Woodland Cree. These men had supernatural powers by which they could kill an enemy, make a woman fall in love, or drive a man insane. Similarly, these sorcerers could provide amulets which could offset the evil influences of other supernatural forces. According to one authority, the Plains Cree looked down upon their woodland relatives because

they were poor fighters "but also feared them for their magical prowess."

From the evidence of early travellers, it is apparent that while the woodland people were not often involved in warfare, they were gallant fighters. Incidents of battles with the Beaver and other enemy tribes during their westward penetration indicate that they were as capable as their plains relatives. For example, explorer Alexander Mackenzie in 1801 said that the Crees "had driven away the natives of the Saskatchiwine and Missinipy River... from there they proceeded West by the Slave Lake... on their war excursions, which they often repeated, even till the Beaver Indians had procured arms, which was in the year 1782."

But the pursuit of food was the main occupation of the Woodland Cree. Fish were caught in nets during the winter, with the women often performing this work. On other occasions, fish were speared by the men, gathered in traps, or caught with hooks made of eagle claws.

Smaller animals and birds, like rabbits, and partridges, were snared with sinew; ducks and geese were lured with decoys and shot; young birds were caught in snares hidden in shallow water. Larger animals such as moose and deer were shot with bows and arrows, often being killed from canoes while swimming across rivers or lakes.

In trapping, the Woodland Cree used snares, deadfalls and wooden traps. Beaver and muskrat were often dug out of their lodges.

When discussing their costumes, a traveller in 1819 said, "Their clothing is made of leather and cloth. The dress of the men is composed of the following articles. A cloth or bandage is passed between the legs and fastened to the waist at each extremity. The leggings extend to the hips and are also attached to the waist. If made of cloth, they are bound with various colours on the outside seams and bottom, but if of leather, the seams are fringed by cutting the border into strips. A long waistcoat is worn, tied or buttoned in front, and over it, a frock, which cover the thighs, furnished with a

hood above and tied around the waist with a belt. The cap is an otter or martin skin decked with the feathers of an eagle's tail. In winter, they carry a blanket over the shoulders which is their only bedding when hunting."

"The stockings of the women." he continued, "are gathered at the knees, and ornamented at the ankles with rows of beads. An under-garment covers the body from the neck to the feet, the sleeves not being sewed to it, but attached to one another by a strip of cloth across the back. Their hoods are fastened at the neck, forming a tippet on the shoulders which, as well as the breast of the under garment, is adorned by stained porcupine quills, beads, and tassels of leather."

In these costumes, the women were considered very attractive. Alexander Mackenzie noted that, "Of all the nations which I have seen on this continent, the *Knisteneaux* (Cree) women are the most comely. Their figure is generally well proportioned, and the regularity of their features would be acknowledged by the more civilized people of Europe."

There was a clear division of duties between the men and the women. The latter did all the cooking, tanning hides, making clothing, quill-working and beading, cutting firewood, making snowshoes, hauling sledges, pitching lodges, and helping with snaring game and net fishing.

The men were responsible for hunting, fishing, making canoes and sledges, trapping, making objects of religion and war, and protecting the camp.

Because of the marginal life of the Woodland Cree, where starvation was always a threat, the arrival of the fur traders brought many benefits. The gun soon replaced the bow and arrow in hunting; sinew or rawhide nets were abandoned in favour of European ones; and the availability of knives, metal pots, axes, and other utensils made life much easier. Similarly, the tedious task of tanning hides was sometimes eased when shirts, blankets, and other cloth objects were bought.

But the presence of white traders also created serious problems. The woodland people abandoned their previous life cycle, which consisted of moving about within their hunting grounds in a constant search for food. Now the emphasis was placed on trapping and some of the animals which provided both pelts and meat were slaughtered indiscriminately. When they were in short supply, the Crees either moved farther away or eked out an existence near the trading posts.

For example, in the late 1700s, a trader described the cycle of Indians living near his fort. In the fall, they were given supplies on credit and went out trapping in the bush. In the spring they returned with their furs, settled their accounts and bought more supplies or liquor from any money still remaining. In May they went out goose hunting for the fort, while others hunted big game or acted as messengers.

A standard payment for summer work at that time was two quarts of brandy for a deer. To earn a quart of brandy, a man had to bring in either ten deer tongues, ten fish, one porcupine, one beaver, or six pounds of deer fat. To get a pound of powder and shot he had to kill 20 geese, and for delivering messages he was given the value of about four beaver skins for every four miles he had to travel.

Because many of the Indians became dependent upon the trading posts for survival, they tended to be more influenced by European practices than the Plains tribes to the south. This meant the abandoning of religious practices, costumes, and beliefs.

More immediate problems, however, were the introduction of liquor and disease. Even as early as the 1770s Andrew Graham wrote, "They are so addicted to drunkenness that they practice every art to produce brandy, and had they free access to it, death only would put an end to their debauch, of which we have had instances." Similarly, he noted that tuberculosis, measles, smallpox, and other diseases introduced by the Europeans, resulted in a high mortality rate.

The fur traders moved into northern Alberta in the 1780s in the wake of the westward moving Cree. By 1800, the Woodland Cree

were being served by trading posts on the North Saskatchewan as well as on the Athabasca and Peace Rivers and at Lesser Slave Lake.

By the middle of the 19th Century, missionaries began to visit the Woodland Cree in northern Alberta, and later established missions among them. The first was a catholic priest, Father Jean B. Thibault, who came up the Saskatchewan River in 1842 and spent some months among the Plains and Woodland Cree at Frog Lake. In the following year he settled at Lac Ste. Anne, from which point he worked primarily among the Metis. In 1845 he went to Cold Lake, while in the same year, Father Joseph Bourassa opened a mission at Lesser Slave Lake.

As early as the 1840s, Methodist missionary Robert Rundle had visited the Woodland Cree, but he devoted most of his energies to the Plains people. In 1855, the Rev. Henry B. Steinhauer, an Ojibway Indian, settled at Lac La Biche, later moving to Whitefish Lake, where he also worked with the Cree.

The third denomination in the area was the Anglican Church. Bishop W.C. Bompass served in the Mackenzie River area in the 1850s, and began to visit the Woodland Cree and Beavers at Fort Vermilion in 1868. Finally, in the mid-1870s, Rev. Alfred Garrioch opened a permanent mission at that place.

In the latter part of the century, the Anglicans were the main denomination in northwestern Alberta, with the Methodists dominating the Saddle Lake region, and the Catholics the areas northwest of Edmonton and in the Fort Chipewyan region. In many cases, native people were employed as catechists or lay-readers, and soon Christianity had a strong influence in all communities.

In the 1880s and 1890s, residential schools were opened at such points as St. Albert, Fort Vermilion, Lesser Slave Lake, and Fort Chipewyan. In part, the missionaries found it easier to teach the children when they were together in one place; but equally important was a desire to take them away from their families to offset practices which the missionaries considered 'pagan.'

By the 1890s, most Woodland Cree bands were well mixed with Metis, and the influence of the Hudson's Bay post manager and local missionary were unquestioned. The big change in this routine occurred in 1898, immediately following the discovery of gold in the Klondike. Many gold seekers went to the Yukon via northern Alberta, and still others were attracted to the territory and remained to trap, trade, or farm. This immediately affected the power of the Hudson's Bay Co., and caused a breakdown of their credit system. It also caused a great uneasiness among the Woodland Cree leaders, who feared that their lands would be taken from them by the new settlers.

The Crees farther south had signed Treaty No. Six in 1876. And although some woodland Crees in the Saddle Lake region had been affected, most of those farther north were not. Accordingly, in 1899, the Canadian Government sent two expeditions into northern Alberta. If a person considered himself to be an Indian, he could accept Treaty No. Eight from the Treaty Commission and retain his status. On the other hand, if he was a Metis or half-breed, he could be registered by the Scrip Commission and receive a paper which entitled him to 160 acres of land.

Some of the Indians were suspicious about the treaty. Keenooshayo, for example, said: "Do you not allow the Indians to make their own conditions, so that they may benefit as much as possible? Why I say this is that we to-day make arrangements that are to last as long as the sun shines and the water runs."

However, they agreed to the terms, with Mootoos and Keenooshayo being among the first to sign at Lesser Slave Lake. From there, the commissioners went down the Peace River and up the Athabasca, gaining the signatures of other leaders.

Attempts were made, both in the Treaty Six and Treaty Eight areas, to encourage farming. Initially, however, they met with little success. For example, in 1881 the Indian Agent reported on conditions at Lac La Biche. "The Indians had no grain and potatoes that they could rely upon for seed this year," he said, "and owing to

the want of time and ammunition, had the prospect of a bad winter." Similarly in 1890, when reporting the progress of the Wah-sat-an-ow band, he said, "Their farming operations are on such a small scale that it is little more than a name. A few of them, however, try to put in a small crop, and the majority hunt or fish as the fancy takes them."

In fact, many of the Woodland Cree saw little need to farm. As long as they could live by hunting, trapping, and fishing, they preferred to do so. Although there were exceptions, this situation continued well into the Twentieth Century, until the decline of fur prices and fur bearing animals, as well as restrictions on commercial fishing, made it impossible for the old ways to continue.

In the meantime, many Indians received an education in residential schools, or later in integrated schools, and began to enter other areas of labour. Some became bush workers, loggers, oil field workers, and hunting guides. Others went to the major cities where they became office workers, secretaries, nurses' aides, and teacher aides.

Within the past decade, many Woodland Cree have been involved in band management, nursing, teaching, and other professions, while on the reserves, farming, commercial fishing, trapping, and hunting have continued to be important sources of their livelihood. With their close association with the white man for so many years, the Woodland Cree have been better prepared than many tribes to meet the demands of today's society.

The Chipewyan Indians

Inhabiting a desolate land, where survival often depended upon the unpredictable movements of the caribou, the Chipewyan Indians were a hardy people who learned to survive under extreme conditions.

They are part of the Athapascan linguistic group, as are their neighbours, the Beaver, Slavey, Yellowknife, and Dogrib tribes. Their name Chipewyan was taken from the Cree term "pointed skins," given to them because of their practice of having tail-like protrubances hanging from the bottom of their shirts. In fact, this characteristic gave rise to a fantastic story of a race of part-human, part-animal creatures which inhabited the far north. The confusion arose from the difficulties of early interpreters in explaining that the tails belonged to the shirts, not to the men. The Chipewyans also were known as *Wechepowuck* by the Crees, *Montagnais* by the French, and Northard Indians by the British.

At the time of white contact in about 1700, the Chipewyans hunted in the area between Great Slave Lake and Hudson Bay. To the north were their deadly enemies, the Eskimos, while south were the Cree, and west the Slavey and Dogrib. And although their area extended to the shores of Hudson Bay, they were not a sea-going people but usually remained in the interior.

Henry Kelsey, a Hudson's Bay Co. fur trader, learned of their existence in 1689 and tried to bring them to the coast to trade, but was unsuccessful. In 1716, however, William Stewart succeeded in locating them and brought ten of them to York Factory to trade. A year later, Fort Churchill was established on Hudson Bay, at the southeast edge of their hunting grounds, and soon the Chipewyans were visiting the post on a regular basis. Those who hunted in the eastern part of their land came each spring and autumn, while those farther away visited only once in every three years.

When the Chipewyans traded, they limited their purchases to guns, ammunition, and metal utensils and soon opened their own thriving intertribal trade with the Dogribs and other interior tribes. In addition, guns gave them superiority in the war which enabled them to push northward into Eskimo territory, and westward to the Peace River. In 1778, when a North West Co., post was opened on Lake Athabasca, most of the Chipewyans abandoned the long trek to Hudson Bay. When a chief arrived at the newly-opened post in that year he said he was "pleased at having Goods at the Lake and promised to stop all his people from going to Churchill."

In the meantime, the Crees farther south had also received arms from the traders on Hudson Bay and had pushed westward along the North Saskatchewan River. When the Beaver Indians retreated from what is now northeastern Alberta, the area was occupied by Woodland Cree from the east and Chipewyans from the north. The latter tribe often penetrated as far south as Beaver Lake during its hunting expeditions. By the time the tribes had carved out their new areas, the Chipewyans were in firm control of the lower waters of the Peace and Athabasca River, Lake Athabasca, and their old hunting area to the east.

Explorer Alexander Mackenzie in 1793 described the Chipewyans as "sober, timorous, and vagrant, with a selfish disposition which has created suspicions of their integrity." At the same time, he found them easy to approach and willing to share their knowledge of the land with the explorer.

He described them as not tall, but seldom corpulent, with a darker complexion than other tribes and with deep, piercing eyes. Some of the men wore black bushy beards, although the majority plucked out any facial hairs.

The Chipewyan had the reputation of being fierce warriors who were frequently fighting their neighbours. In 1771, for example, Samuel Hearne engaged some Chipewyans at Fort Churchill to assist him in finding the Coppermine River. When between seventy and eighty warriors accompanied him, he learned that the trip was an

excuse for attacking the Eskimos. When they finally discovered a small encampment, the Chipewyans made an early morning attack and slaughtered thirty men, women, and children.

"The shrieks and the groans of the poor expiring souls were truly horrible," said Hearne, " and was much increased at the sight of one young girl, about eighteen years old, whom they killed so nigh me, that when the first spear struck her, she fell down and twisted about my feet and legs."

In about 1760, the Chipewyans established an uneasy peace with the Crees after they had driven them away from Lake Athabasca. Similarly, they fought with the Yellowknife and Dogrib Indians to prevent them from opening direct trading relations with the forts on Hudson Bay, but once the companies moved inland, the need for hostilities ceased. With the Eskimos, however, the feeling of hatred was retained and occasional skirmishes continued well into the Nineteenth Century.

The caribou was the main source of food for the Chipewyans. During the summer, one of the favourite means of killing them was by spearing them from canoes as they swam across rivers or lakes. On other occasions, they were driven into traps where they were killed with arrows. In winter they were snared or caught in deep snow.

Other animals, such as buffalo, muskox, and moose were killed in lesser numbers, while fish and waterfowl often supplemented the Chipewyan's meagre diet. As their hunting grounds included both the open barrenlands and woodlands farther south, the bands often moved from place to place, either following the migrations of the caribou or eking out a marginal existence.

Unlike the tribes to the south, the Chipewyans did not have any structured form of leadership, other than the head of a family. As the people usually travelled in family groups, this was sufficient, except during intra-tribal disputes, when superior strength often dictated the outcome.

Similarly, the Chipewyans had only a form of guardian spirit worship as their religion. There were no public prayers nor rituals; instead, each individual had his own spiritual protector, sometimes as the result of a dream. Often the figure of this protector was painted on a shield when going to war or the skin of the animal was placed with the body of the deceased.

On the other hand, great faith was placed in the abilities of Indian doctors, who, through the use of medicinal herbs and incantations, could effect cures for various ailments. These men, whose powers often came as a result of visions, could also cast evil spells upon their enemies.

The winter dress of a Chipewyan man consisted of a thigh-length caribou skin shirt with the hair left on; moccasins attached to leggings which, extended to the waist where they were supported by a belt; and a breechcloth which hung down in front and back. In severe weather, the moccasins were stuffed with caribou or moose hair. The man also wore a belt, mittens, and a cap made from the skin of a deer's head. Over this entire costume, he wore a robe made of several caribou or fawn skins sewn together.

"Thus arrayed," said Alexander Mackenzie, "a Chipewyan will lay himself down on the ice in the middle of a lake, and repose in comfort; though he will sometimes find a difficulty in the morning to disencumber himself from the snow drifted on him during the night."

The women's costume consisted of a dress which extended to her ankles and was fastened at the waist with a belt. For those with children, the dress was very full about the shoulders so that infants could be carried on their backs next to the skin. On their legs, the women had moccasins and leggings which were tied below the knee.

Those who visited the Chipewyans during the Eighteenth Century felt that the place of the woman was inferior to that of other tribes. She was the beast of burden who carried the family possessions or pulled the toboggan; the men had the reputation of beating their wives unmercifully. Yet, when William Butler visited a

Chipewyan camp on the Athabasca River in 1873, he found a pleasant family scene.

"Some ten or twelve people congregated around a bright fire burning in the centre," he said. "The lodge was large, requiring a dozen moose skins in its construction. Quantities of moose or buffalo meat, cut into slices, hung to dry in the upper smoke. The inevitable puppy dog playing with a stick; the fat, greasy child pinching the puppy dog, drinking on all fours out of a tin pan, or sawing away at a bit of meat; and the women, old or young, cooking or nursing... ."

Because of their marginal life, the Chipewyans had a culture which was relatively weak and easily replaced by practices brought in by Cree employees of the fur trade. As a result, outside rituals were introduced, and even the more simple art forms were abandoned in favour of ornate designs borrowed from neighbouring tribes. Similarly, objects of European manufacture soon replaced their own.

But a more disastrous effect of the white man's arrival was the introduction of diseases. An epidemic of smallpox in 1781 wiped out nine-tenths of the tribe, in some cases taking away entire bands. Partly as a result of this catastrophe, the Chipewyans ceased their warring activities against enemy tribes. The population of the tribe at the time of white contact was estimated to be 3,500 but it declined to less than 1,000 at the beginning of the Twentieth Century because of disease and starvation.

During the early period, the Chipewyans refused to accept alcohol. In the 1780s, Andrew Graham commented that they "drink no spiritous liquors:," while in 1793 Alexander Mackenzie said that "As the people are not addicted to spiritous liquors, they have a regular and uninterrupted use of their own interest." Yet the liquor continued to flow into the trading posts, and by 1819 the situation had so changed that a traveller noted that "They are as much corrupted by spirituous liquors as the Crees."

Soon the entire economy of the Chipewyans became tied to the trading posts. The tribe depended upon them for essential goods and

devoted much of their time to trapping and preparing hides for the trade.

During the mid-Nineteenth Century, missionaries began to visit the Chipewyans and found ready converts among them. Among the first was Father Joseph Bourassa, who went among the Chipewyans and Crees at Cold Lake in 1845. In 1865, Bishop W. C. Bompas of the Anglican Church began his work in the Mackenzie River area, and later extended his services to the tribes farther south. Soon both the Roman Catholics and Anglicans had established churches in Fort Chipewyan and in 1899 a visitor to the fort reported that "All the Indians we met were with rare exceptions professing Christians, and showed evidences of the work which missionaries have carried on among them for many years. A few of them have had their children avail themselves of the advantages afforded by boarding schools established at different missions."

During the latter part of the Nineteenth Century, one band of Chipewyans normally hunted in the Cold Lake area, near the North Saskatchewan, while the others ranged much farther to the north. In 1876, when the Canadian government negotiated a treaty with the Cree and Ojibwa Indians, the southern leader of the Chipewyans, Kin-oo-say-oo, and his head man, Antoine Xavier, attended the sessions at Fort Pitt and signed on behalf of their followers.

Not until 1899 did others in the tribe discuss a treaty. In that year, the Chipewyans in northern Alberta, Northwest Territories, and part of northern Saskatchewan signed Treaty No. 8 with the government. Signing for the Chipewyans were Laurent Dzieddin and Tousssaint, of Fond du Lac; Alex Lavoilette, Julien Ratfat, and Sept. Heezell, of Fort Chipewyan; Michael Mamdrille and William Kiscorray of Fort Smith; Adam Boucher of Fort McMurray; and Louison Ahthay, Oliver Ajjericon, Vital Lamoelle, and Paulette Chandelle of Great Slave Lake. A total of 215 Chipewyans accepted the terms of the treaty during the long trek made by the Commissioners through the north.

The treaty provided for the surrender of all hunting grounds by the Indians in exchange for reserves, treaty money, tools, and implements, and other benefits.

The Chipewyans had doubts about the terms which were offered. "The Chief at Fort Chipewyan," said the commissioner, "displayed considerable keenness of intellect and much practical sense in pressing the claims of his band. They all wanted as liberal, if not more liberal terms, than were granted to the Indians of the plains." At last, however, they accepted the treaty. In 1907, the remainder of the Chipewyans in northern Saskatchewan signed Treaty No. 10, receiving the same terms.

For some years after these events, life went on as before, the only exception being that each spring, an Indian Agent travelled through the area, paying treaty money. For example, when describing the trip in 1908, the agent said: "We proceeded on the Hudson's Bay Company's steamer *Primrose* to Fort Chipewyan... On June 25th, we paid annuities to the 564 Indians in the two bands there. During the year, 25 births and 14 deaths occurred." Describing conditions in that year, he said, "They reported a hard winter and a shortage of fur, but they managed to survive the winter with little assistance from the trading posts."

In Alberta, five reserves were established for the Chipewyans. The largest of these was the southerly Cold Lake Reserve which, by 1967, had a population of 789 persons. Adjoining Lake Athabasca was the Chipewyan Reserve with a population of 223, while north of Lac La Biche was the Janvier Reserve, with 161 people and the McKay Reserve with 161. A reserve at Fort McMurray contained mixed Chipewyan and Cree bands totalling 87 persons. In addition, six reserves were surveyed in Saskatchewan and two in Manitoba, while the Indians in the Northwest Territories did not receive reserves.

For the Indians in the north, the dramatic change in their lives occurred during the 1920s when aviation ended the isolation. Within a few years, lakes were being fished commercially and the products

flown out to eastern markets; men were travelling to their distant traplines by airplanes; and outside civilization was thrust upon them. Similarly, the decline of fur markets after the Second World War, the loss of trapping areas, the improvement of educational facilities, and the expansion of welfare services all had dramatic but not always positive effect upon the tribe. Yet many Chipewyans have prospered, some seeking new opportunities in urban communities and others finding a satisfactory life on their reserves.

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Chapter Four

A Century of the Fur Trade

John W. Chalmers

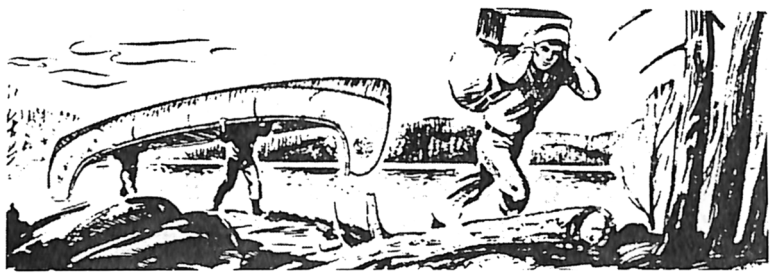
It was a day like all days. At least, so it must have seemed that spring morning in 1778, when the fur trader Peter Pond began the portage that was to take him from the Churchill River basin to that of the Great River of the North, whose very existence was known to the fur traders only by unreliable native hearsay.

The twelve-mile stretch destined to be known as Methy Portage or Portage La Loche was not merely another carrying place between two rivers; it was a continental height-of-land. North of it all waters flowed to the Arctic; to the south their destiny was in Hudson Bay and the Atlantic. The portage, or its highest point, therefore, was the boundary of Rupert's Land; that quarter of a continent which constituted the biggest land grab in history. For by charter from Charles II in 1670, all territories draining into the Bay became the absolute property of the Governor and Company of Adventurers of England Trading into Hudson's Bay, later known as the Hudson's Bay Company. The fact that the Merry Monarch really had no very valid title—or even knew the extent of the property—did not prevent him from transferring it to a corporation of his friends. But even more important than the real estate was the fur trade monopoly which accompanied it.

Of course, the Company was expected to pay ground-rent to the sovereign on appropriate occasions, its charter calling for "two Elkes and two Black Beavers whensoever and as often as wee our

Heires and Successors shall happen to enter into the said Countryes Territoryes and Regions hereby granted." The first time the rent was paid to a reigning monarch–and only the third in history–was 1939, when George VI collected two elkhead and two beaver pelts at the old Fort Garry gateway in Winnipeg.[1,2] Some symbolism may be found in the fact that the event occurred on May 24th, the birthday of his great grand-mother, Queen Victoria. The most recent occasion on which the landlord collected her rent was on July 14, 1970, during Manitoba's centennial celebrations when Elizabeth II accepted two elk head and two beaver—for the first time live—at the same location.[3]

Since the Company now operates under a new Canadian charter, with no reference to elk or beaver, this ceremony may be the last. Perhaps it is just as well; one wonders what the Royal Family is doing with the accumulating elkheads.



Portaging. Hudson's Bay Company.

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[1] 1939. "The Company pays its rent." *The Beaver*, Outfit 270, No. 1, June: 6-9.

[2] 1939. "May it please Your Majesty." *The Beaver*, Outfit 270, No. 2, September: 5-11

[3] 1970. "The Queen accepts." *The Beaver*, Outfit 301, No. 3, Winter: 46-67.

Turning back to Peter Pond, we know that he was not the first white man to cross the unmarked boundary between Rupert's Land and the great North-West, sometimes known as the Indian country. In 1771, on his third attempt, Samuel Hearne had succeeded in reaching the shores of the Arctic from Churchill Factory on Hudson Bay. But Hearne's tremendous achievement was abortive. Searching for minerals, especially copper, and not for fur, he was unsuccessful, and many years were to pass before the Honourable Company that employed him were to send others in his wake.

Even before Hearne's memorable trek, however, another Company man had crossed the divide between Hudson Bay and the Arctic. This was William Stewart (or Stuart) in 1715. At that time, constant warfare between the Home (Cree) Indians (Hudson Bay Crees) and Northern (Chipewyan) Indians was preventing extension of the Company's operations along the coast north of York Fort, at the mouth of the Nelson. William Stewart, guided by a Chipewyan heroine Thanadelthur, known usually only as 'the slave woman,' penetrated far inland, north and west of York, to arrange a peace between the warring bands.[4] It is impossible to say how far Stewart went, but he appears to have reached the area between Great Slave Lake and Lake Athabasca east of the Slave River. In any event, his efforts, or rather those of Thanadelthur, were successful. Peace was achieved, and as a result, it was possible to establish a new fort at the mouth of the Churchill. But like Hearne's, Stewart's was not a trading expedition. Its goal having been realized, it was not repeated.

Although Pond was not a Company man, he was not leaving Rupert's Land so that he could conduct his business legally outside the English Company's realms. Like other independent traders, he treated its monopolistic pretensions, if not with contempt, then certainly with indifference. Since 1775, he had been competing with

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[4] Johnson, Alice M. 1952. "Ambassadress of peace." *The Beaver*, Outfit 283, No. 3, December: 42-45

HBC in its own back acres, first near Lake Dauphin, in what is now Manitoba, and subsequently on the North Saskatchewan.

No, Pond's westward odyssey was not motivated by business ethics. It was well known that the richest furs came from the far northwest. For a hundred years the English Company, relying on its charter, had been content to let the Indians bring their furs across half a continent to the shores of Hudson Bay. Only in 1774 had it established its first inland post at Cumberland House, to meet the natives half-way, more or less. It had done so because the opposition were intercepting the Indians on their months-long journey to the Bay. So Pond was heading farther west and north to the very sources of the furs.

An unusual man was this Yankee from Connecticut. Born in 1740, he served four enlistments with the British territorial army, rising from private to commissioned rank. His service included campaigns during the Seven Years' War, which resulted in the fall of New France. He then returned home to Milford for a few years, where he married and sired at least two children, but in 1765 he left, to spend the rest of his career as a trader. At first he was active in the Detroit area, then from 1773 to 1775 in the Mississippi Valley. Perhaps it was the growing tension between Great Britain and her American colonies that caused him, who had taken the king's shilling four separate times, to transfer his base of operations to Montreal. Most likely, it was greater availability of supplies and financing. After all, when he left the fur trade, he returned to his home in the United States, where he became an army captain and secret government agent.

Renowned as a diplomat and peacemaker among hostile Indian bands in the Mississippi Valley, at the same time Pond's character seems to have had a turbulent and even violent component. Had he been wholly a man of peace, a single enlistment in the British Army might have been understandable on grounds of patriotism, but Pond returned to military service a second, third, and fourth time. Early in

his fur-trading career, he fought a duel, as he rather laconically notes in his journal:

> ...Hapend that a parson [person] who was in trade himSilf to Abuese me in a Shamefull manner Knowing that if I Resontd he Could Shake me in Peaceis at same tim Supposeing that I Dair not Sea him at the Pints or at Leas I would not But the Abuse was two Grate we met the Next Morning Eairley and Discharged Pistels in which the Pore fellow was unfortennt I then Came Doan the Cuntrey & Declard the fact But thare was none to Prosacute me.[5]

And in the North-West, he was later involved in two homocides of opposing traders, the second of which resulted in his ultimate withdrawal from the trade.

From perusal of extant fragments of his journals, one gains the impression that Pond was ignorant and uneducated. In an era when orthography was tolerantly regarded as a matter of personal preference, his spelling was wildly eccentric, apparently based strictly on aural inspiration. At the same time, he seems to have had an adequate command of French, perhaps picked up during his military career, and indeed his spelling of the language is often better than that of his native tongue.

Yet Pond was more than a cunning Yankee trader with his eye on the main chance. Practically from the time he first crossed the Methy Portage, he had a dream, a dream which grew to become a veritable passion, an *idée fixe*. That was nothing less than to discover the illusive and fabled North-West Passage, which he gradually came to believe existed, not around the top of North America, but through the continent. Cook's discovery of his great (mythical) river (of which the explorer believed the Inlet to be only the mouth), convinced

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[5] Gates, C.M. ed. 1965. *Five Fur Traders of the Northwest.* St. Paul. Minn: Historical Society, pp. 27-28

Pond that it was the same stream as the Great River of the North. After all, his Indian informants told him that it flowed west from Great Slave Lake. By Pond's faulty calculations, the Pacific Ocean could lie only a few days' travel down the river. All of these developments were still in the future, however, that morning in 1778 when Pond descended to the floor of the beautiful Clearwater valley, the first river he encountered whose waters flowed westward.

Pond's first view of the Clearwater must have been very similar to that of D.W. Harmon, who wrote in 1808:

> Just as we arrive at this end of the Portage we have from a high hill an extensive and beautiful prospect of the level Country that lies before us as well as of the different windings of a small River that we are to descend.[6]

In 1833, Capt. George Back, R.N. described the same view:

> ...we came suddenly upon the spot from which the picturesque and beautiful view from Portage La Loche bursts upon the sight. A thousand feet below, the sylvan landscape lay spread before us, to the extent of thirty-six miles in all the wild luxuriance of its summer clothing. Even the most jaded of the party, as he broke from the gloom of the road on this enchanting scene, seemed to forget his weariness, and halted involuntarily with his burden, to gaze for a moment, with a sort of wondering admiration, on a spectacle so novel and magnificent.[7]

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[6] Lamb, W. Kaye, ed. 1957. *Sixteen Years in Indian Country: The Journal of Daniel William Harmon, 1810-1816.* Toronto: Macmillan.

[7] Back, George. 1970. Narrative of the Arctic Land Expedition. (Reprint ed.). Edmonton: Hurtig, 71p.

Some years later, actually in 1844, Lieut. J.H. Lefroy, R.A., added this contribution to the literature on Methy Portage:

> It is celebrated for the view from the north end. It is a wide and regular valley, of great depth stretching for a distance of thirty miles to the west. The sun was just setting as I arrived there, the light glancing from the nearer foliage, and filling the distance with golden haze; there is not that variety in the autumnal tints of a forest here which makes those of Canada so wonderful, but quite enough to compose a very beautiful picture. A portion of wood in the distance was burning, and there was an uncommon felicity in the manner in which the columns of smoke rose up against a dark mass of Pines which crossed the valley behind them. The Clearwater river winds through the midst, sometimes expanding into a placid little lake, then diminishing to a thread of light barely caught among the trees. Upon the whole I have seen few views more beautiful.[8]

The beautiful valley attracted many admirers, one of whom was Dr. John Richardson, R.N., who visited it in 1848 and wrote:

> The view... extends thirty or forty miles, and disclosed, in beautiful perspective, a succession of steep, well-wooded ridges, descending on each side from the lofty brows of the valley to the borders of the clear stream which meanders along the bottom. Cliffs of light coloured sand occasionally show themselves, and near the water limestone rocks are almost everywhere discoverable. The Pinus banksiana occupies most of

[8] Lefroy, John Henry. 1955. *In Search of the Magnetic North.* Edited by George F.G. Stanley. Toronto: Macmillan.

> the dry sandy levels; the white spruce, balsam, fir, larch, poplar, and birch are also abundant.[9]

Richardson goes on to detail the numerous carrying places on the Clearwater, which he lists as follows:[10]

White Mud Portage (Portage de Terre Blanche)	670 paces in length
Pine Portage (Portage des Pins)	1,000 paces in length
Bigstone Portage	600 paces in length
Nurse Portage (Portage de Bonne)	2,610 paces in length
Cascade Portage	1,380 paces in length
Portage of the Woods	2,350 paces in length

This last one ended three miles above the Clearwater's confluence with the Athabasca. The view of the latter from that location greatly impressed fur trader and explorer Thomas Simpson in 1837, who wrote:

> From the high point of 'the forks' we enjoyed a fine view of that majestic stream, stretching away to the north, its broad bosom studded with numerous wooded islands, which give it a grand lakelike appearance.[11]

Peter Pond may have been equally impressed by the beautiful scenery through which he travelled (and no doubt he was by the portages), but if he wrote down his impressions, we no longer have the record.

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[9] Richardson, John. 1852. *Arctic Searching Expedition.* New York: Harper and Brothers.

[10] *Ibid., p.117.*

[11] Simpson, Thomas. 1843. *Narrative of the Discoveries on the North Coast of America.* London: Richard Bently.

However, descending the Clearwater, he soon came to the Athabasca, formerly also called the Elk or Biche. He then turned downstream, to the north. Within two or three days he had reached the river's mouths and soon established on that branch in the delta which is also called the Athabasca the first fur trading post in the North-West. Although it continued in existence for ten years, today its location is not exactly known. When Philip Turner reached the delta of the Athabasca in 1791, he wrote "...the river at this place parts into two branches...(we) went in the East branch N ½ (mile) and came to Peter Pond's old house... ."[12] Almost certainly the site has been destroyed by erosion resulting from shifts in the river's bed.

No doubt Pond's attention was drawn to outcroppings of the tar sands that were to become so important two centuries later, for these sands were everywhere from the headwaters of the Clearwater to the Athabasca delta. Many other early visitors observed this black gold, among whom were D.W. Harmon[13] in 1808, Franklin in 1820,[14] and John Richardson in 1848, who noted that at Red River (now MacKay River) the tar was soft enough to be fluid, and several small birds had been caught in a viscous stream of the stuff.[15] H.S. Moberly, who established Fort McMurray in 1870, also commented on this natural resource:

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[12] Tyrrell, J.B., ed. 1934. *Journals of Samuel Hearne and Philip Turnor.* Toronto: The Champlain Society.

[13] Lamb, *op. cit.*, p. 115.

[14] Franklin, Jon. 1969. *Narrative of a Journey to the Shores of the Polar Sea in the Years 1818, 20, 21, and 22.* Edmonton: Hurtig

[15] Richardson, *op. cit.*, p. 125

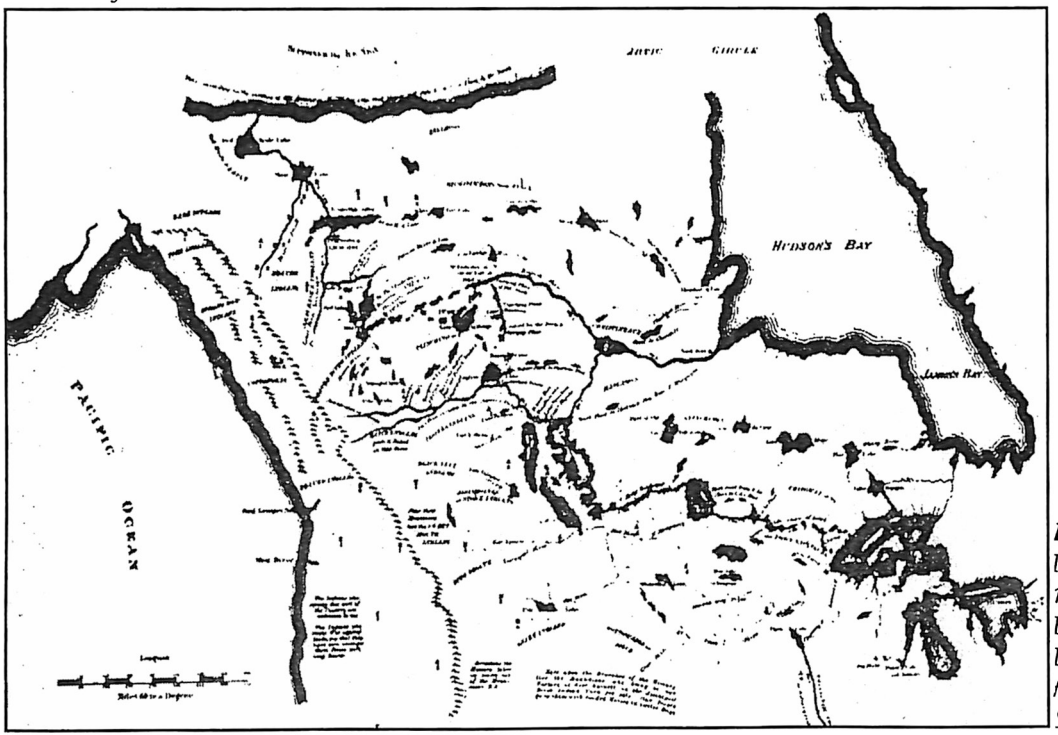

Figure 4. *Peter Pond's 1785 map. Boreal Institute for Northern Studies*

> At a few places the tar flows quite freely, and the Hudson's Bay Company collected all they required for their boats in the North. The crude product is boiled to evaporate the oil, when it becomes the best of tar.[16]

It is interesting to note that both Richardson and Moberly were under the impression that the tar was closely associated with beds of coal.

However, Pond's interest in the sands could have been only casual. To a fur trader, their only values were to fuel a campfire and to provide pitch, which, mixed with spruce-gum, was effective in sealing the seams of the fragile birchbark canoes—both uses being taught to white newcomers by natives.

Unlike Hearne's earlier foray, Pond's initial expedition to the North-West was a brilliant success. After his first winter's trade, he had acquired so many prime furs that he could not take them all to market even in the four canoes which he had brought north onbehalf of himself and his partners, and had to cache some, to be recovered later. These he brought out in 1780.

The next few years were busy ones for the Yankee trader. Not all of his movements in this period are known. Some winters he passed on the Athabasca, but not all. In 1781-82 he wintered at Lac La Ronge in competition with one Jean Etienne Waden, who was killed by gunfire in Pond's presence in March of the latter year. Whether Waden's death was accidental or deliberate, and if the latter, whether Pond or his subordinate Toussaint Le Sieur was responsible is unclear. Although Pond was charged with murder, it is equally uncertain whether the charge was dropped or whether he was acquitted. In any event, by the fall of 1783 he was back on the Athabasca. The previous winter he had spent at Isle à la Crosse,

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[16] Moberly, Henry J. (with W.B. Cameron). 1929. *When Fur was King.* London and Toronto: J.M. Dent & Sons, etc.

probably being too late in 1782 to reach the fur Eldorado of the North.

By the end of the 1770s, changes were taking place in the fur trade, and not merely extensions in the areas being exploited. Aroused at last by the aggressive, Montreal-based interlopers, the English Company was waking from its 'sleep by the frozen ocean,' and establishing inland posts and forts to meet the competition of the 'free traders.' They, in turn, realized that if they were to survive the competition, not only of those of their own ilk but particularly of the powerful and now-aroused HBC, they themselves would have to unite. The result was the formation of the North-West Company, an association of partnerships rather than a corporation, which Pond joined in 1785. The new concern was then six years old, although reorganized on a permanent basis only in 1783. However, Montreal-based and financed traders continued to fight a generally losing battle with both HBC and NW Co.

The year 1785 was important to Pond for another reason, as it was then that he completed the first of several maps which he made of the North-West. Based on his own first-hand experience, printed resources, and information from natives, it covers the area from about 45° north to the Arctic, from James Bay and Lake Huron to the Pacific. Many outlines of lakes and rivers are erroneous, but in a number of ways the document indicates a surprisingly accurate knowledge of the territory still unseen by white men. The relationship of the Clearwater and Athabasca rivers to the other and to Lake Athabasca is clearly shown, and the outline of the latter is quite good. Farther north, the map is less dependable, being based largely on hearsay, but Pond correctly depicts the Slave River running into Great Slave Lake (and also the Peace) and the yet-unnamed and undiscovered (by white men) Mackenzie leading from the western end of the lake ultimately to the Arctic. Latitudes and especially longitudes, however, are quite incorrect–Pond was no surveyor. Thus, the mouth of the Athabasca which is about 58° 40'N, 111°W he has located at 60° N 129° W.

Later, seduced by Cook's discoveries, real and inferred, he would divert the Great River of the North westward to the Pacific, sending Alexander Mackenzie down the wrong waterway to the wrong ocean and leading him to call the former his River of Disappointment.

When Pond returned to the Athabasca, in 1785, it was no longer as an independent trader but as a powerful concern. As such, his area of responsibility widened, and so did his travels. He journeyed to the south shore of the Great Slave Lake, and up the Peace to the present Fort Vermilion area, inevitably discovering that that river did not flow into Slave Lake but united with the Rivière des Rochers to form the Slave–and sometimes, depending on respective levels, it even discharged through the Chanel des Quatres Fourches, into Lake Athabasca.

The Nor'Westers' serious competition did not come from the prestigious Hudson's Bay Company, still slowly pushing across the continent, but from a rival Montreal-based concern, Gregory, McLeod and Co., a small firm inexperienced in the North-West trade. Their man in charge of their Athabasca operation was John Ross; another partner was Alexander Mackenzie.

In 1787 the two groups were deadly competitors for the Chipewyans' trade. The Nor'Westers, more numerous than their opponents, were applying coercion to the Indians to obtain their business. Such questionable tactics led to open warfare between the two groups, and in a scuffle one of Pond's men, a French Canadian named Péché, shot and killed the unfortunate Ross. Péché immediately fled, spending three years with the Chipewyans and ultimately escaping scot-free. Two of Pond's men were arrested and conveyed to Lower Canada for trial, but were acquitted either through lack of jurisdiction or because of insufficient evidence.

The Montreal partners realized that disaster was the inevitable outcome for both concerns if such confrontations were allowed to continue. The result was a merger under the name of the larger company. Arrangements were made for Mackenzie to take over

direction of the Athabasca region from Pond, who was to withdraw from the operation of the trade and devote his time solely to exploration. The two men spent the winter of 1787–1788 together at Pond's post. No doubt during the long winter night the Yankee bent the Scot's ear with his dreams of an inland North-West Passage and convinced him of the validity of his latest map showing the river route to the Pacific. In any event, the following year saw Mackenzie's first and unsuccessful attempt to reach the Western Sea.

In 1788, the Yankee returned to Montreal, perhaps to receive directions as to his exploring expeditions. However, he never went back to the Land of Peter Pond, returning in 1790 to his home in Connecticut that he had left so many years ago. Here in 1807 he died in poverty. But in Saskatchewan today a great lake and a school have his name, and at Fort McMurray, Alberta, a shopping centre, a hotel, and another school are called after him.

Pond's final departure and the closing of his post both occurred in 1788. In that year, on behalf of the Nor'Westers, Mackenzie's cousin Roderick McKenzie built the first Fort Chipewyan on the south shore of Lake Athabasca, at what is now called Old Fort Point. It was from here that Alexander Mackenzie began his 1789 voyage to the mouth of the river that now bears his name.

This first Fort Chipewyan may be considered the northern limit of the Land of Peter Pond. Like the delta of the Athabasca, just to the west, it is part of the great alluvial plain that constitutes almost all of present-day Alberta east of the Rockies. But a dozen miles across the water is the Canadian Shield, its convoluted granite folds giving the old name of Lake of the Hills to the Athabasca. There are no tar sands in that direction; they all lie to the south.

Mackenzie's failure to reach the Pacific via his River of Disappointment did not quench his desire to find a route to the Western Ocean. If his own river would not lead him there, perhaps another one would. The Peace not only had its origins far to the west: by all reports, it flowed, not from but through the Stony Mountains. But if there was one thing that the young explorer had learned in his

expedition to the Arctic, it was that dead reckoning, especially from a starting point very uncertainly located on the earth's surface, was no substitute for astronomical navigation based on proper instruments and training—neither of which Mackenzie possessed. Could he obtain them? Instruments—sextants, chronometers, compasses, etc.—were available provided one possessed the financial resources, which the North-West Company did. The technical training was something else; it required not only instruction but adequate

Sir Alexander Mackenzie. B.C. Provincial Archives.

mathematical and other skills as well as a suitable general education, which Mackenzie was not sure he had. However, in June 1790 at Cumberland House he met Philip Turner, HBC surveyor—at that date, relations between officers of the two arch-rivals in the fur trade were still fairly amicable. This meeting, another in August of the same year, and a third in 1791 at Buffalo (now Peter Pond) Lake apparently convinced Mackenzie that the science of astro surveying was not beyond him. He therefore proceeded to England to learn the requisite skills in preparation for a second overland expedition to the Pacific.

Meanwhile, Turnor with his assistants Peter Fidler and Malcolm Ross were carrying the HBC red ensign, at least metaphorically into the Athabasca, the richest domain of the rival Company. Since they sought knowledge and not furs, the Nor'Westers treated them hospitably. During the winter of 1790-91 they were guests of the bourgeois Patrick Small at the NW Co. post at Isle à la Crosse, and were made equally welcome by Roderick McKenzie at Fort Chipewyan. There Turnor repaid the debt by determining the true location of the Nor'Westers fort, so that when Mackenzie began his epic journey to the Western Ocean in 1792, he was under no illusion that a few days' travel would bring him to salt water.

Throughout the Nineties, Fort Chipewyan continued to serve as headquarters for the Nor'Westers' constantly expanding operations down the Slave and Mackenzie, up the Peace, and even eastward along the length of Lake Athabasca. About 1799 or 1800, however, the post was moved across the lake to the iron-hard granite site which it has occupied ever since, and thus out of the Land of Peter Pond. However, it was by no means the only fur post to operate on the Lower Athabasca, although most activity appears to have occurred after Fort Chip was moved across the lake.

In 1791, Turnor and his party reached the mouth of the Clearwater, on the north side of which Turnor noted the existence of a Canadian post. Although it appeared deserted, it was obviously not abandoned for, as the diarist noted, "...they have Birch rind, Pimecon

&c. locked up in their warehouse and a Garden planted with potatoes which are in a thriving condition."[17] Two days later, as they proceeded down the Athabasca, Turnor noted "...an old Canadian House won the east side which was left when they built on the Pillicon River it was a Winter trading House for the Southern Indians and dependant on the Athapescow Lake House,"[18] i.e., on Fort Chipewyan. In 1799, the Nor'Westers' great mapmaker David Thompson noted the existence of a new post at the mouth of the Clearwater, south of that stream and on the east bank of the Athabasca. It is uncertain whose post it was, perhaps the North-West Company's, or of some rival. Apparently this was not the first fur post at this site. When H.J. Moberly established Fort McMurray at the mouth of the Clearwater, he discovered traces of an even earlier establishment. He writes:

> I was surprised to discover... evidences of a previous post at this identical spot. Enquiry disclosed the fact that, eighty-six years before, this forgotten post had been abandoned in consequence of the death from smallpox of almost all the Indians in the locality.[19]

One wishes that Moberly had given us more information about his enquiries concerning this fort, which by his reckoning would have been closed in 1786, and of course erected even earlier.

By 1804, when David Thompson again travelled down the Athabasca, he noted that the Nor'Westers had moved their establishment, now known as Fort of the Forks, to the west side of the river.

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[17] Tyrell, *op. cit.*, p. 389.

[18] *Ibid.*, p. 392.

[19] Moberly, *op. cit.*, p. 142.

Thus it seems that no fewer than five fur posts were erected at the junction of the two rivers. These may be listed as follows:

Established in or by	Location	Name	Noted by
1786	South of Clearwater Mouth		Moberly
1791	North of Clearwater Mouth	McLeod's House	Turnor and Fidler
1799	South of Clearwater Mouth		Thompson
1804	West side of Athabasca, opposite Clearwater Mouth	Fort of the Forks	Thompson
1870	South of Clearwater Mouth	Ft. McMurray	Moberly

No two of these apparently were ever in existence simultaneously, a fact suggesting the relative unimportance of the area as a source of furs.

Until the turn of the century, the commercial rivalry between the Hudson's Bay and the North-West Company was intense but fairly friendly. Frequently the two concerns built their posts side by side, within the same protective palisades. The bourgeois, or officers in charge, entertained each other at Christmas and on Hogmanay, assisted and supported each other in times of need, danger, and distress, as Nor'Westers Small and McKenzie did for Fidler and his followers in 1791. After the turn of the century, however, the rivalry became more intense, occasionally leading to threats, coercion, and even physical violence. This struggle culminated in 1821, when the two great concerns of the fur trade, exhausted by the internecine rivalry, united under the name of the older company.

On Lake Athabasca, the English Company challenged the Nor'-Westers in 1802 by erecting Nottingham House on the English Island, close to the new Fort Chipewyan. The Nor'Westers were well established north and west of Lake Athabasca, and had nothing to fear from the newly-arrived competition in that direction. To undercut it from the south in 1802, they established a post at Pierre

au Calumet, on the right-hand bank of the Athabasca about fourty-odd miles downstream from the Clearwater, or Little Athabasca. Its bourgeois was John Clarke. By 1804, the Nor'Westers were also operating the Fort of the Forks, on the right bank of the Athabasca, opposite the Clearwater's mouth.

Peter Fidler, at Nottingham House, found the going too rough, and in 1806 the HBC withdrew from the district, not to return for nearly a decade. The Honourable Company was not the only opposition to confront the Nor'Westers in the Athabasca. In 1799, there appeared the New North-West, commonly called the XY, Company from the mark or brand it placed on its bales of trade goods or furs. Its men were known as 'potties,' probably a corruption from petits, from the relatively small size of the concern. Alexander Mackenzie was its leader. In 1804, however, it was absorbed by the older North-West Company, and its Athabasca post, location now unknown, was closed.

During the second decade of the new century, the embers of hostility between the two great rivals burst into open flame. From the Red River to the Qu'Appelle, they erupted into the Pemmican War, the Nor'Westers on one side, the English Company and the Selkirk Settlers on the other. The newly-aggressive HBC returned to the Athabasca in 1815, establishing its Fort Wedderburn on Potato Island, a scant mile from Fort Chipewyan. In opposition to Pierre au Calumet, Colin Robertson, in charge at Fort Wedderburn, the same year sent Thomas Thomas to build Berens House, on the left bank of the Athabasca approximately opposite the Nor'-Westers' post. As Robertson's successor, George Simpson reported, "The chief object of establishing this Post is to oppose the N.W. which have the entire command of a valuable band of Cree Indians in this neighbourhood."[20]

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[20] Rich, E.E., ed. 1938. *Simpson's Athabasca Journal.* The Publications of the Hudson's Bay Record Society, Vil. I. London: The Champlain Society.

For the next six years, here as at Fort Chip, the confrontations stopped just short of open warfare. In 1819 the Nor'Westers forced the English Company to close down. Simpson has summarised the incident:

> Had a conversation with Mr. McAulay about the property delivered up to the N.W. at Pierre au Calumet last year, it appears that he and his people were on the point of starvation in consequence of the Fishery being neglected, and his Opponents debauching the Fort Hunters; he applied to Mr. Stuart for relief who gave him a few provisions on the following humiliating terms; *viz.*: that the provisions should be paid for at the enormous prices stipulated in the agreement; that he should immediately withdraw the establishment & himself and people to Fort Wedderburn; that the servants of the Hudsons Bay Coy. should not trade with the Cree Indians belonging to that neighbourhood until after the 1st September, 1820, and that he and his men should remain idle until the 1st of June. The property in his possession to the amount of from 3 to $400 was deposited in the hands of Mr. Stuart as a pledge that the terms of the agreement should be duly compiled with; it appears however, that Mr. McDonald did employ some of the people in the course of the winter, and in consequence of this infringement they retain the property.[21]

Simpson, newly appointed as district superintendent, had no intention of tamely submitting to Nor'West aggression, and in 1820 he sent Joseph Greill, a clerk, to reestablish Berens House.

In that time of desperately serious struggle, humorous incidents were few, and probably did not seem very funny at the time. One, however, involved Greill, a German ex-sergeant of the mercenary De Meuron regiment which had fought for the British in the War of 1812. Greill had subsequently joined the Company as a clerk, as had

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[21] *Ibid.*, pp. 46-67.

Jonas Oxley, a British half-pay army lieutenant. When Simpson proposed to send Oxley to serve under Greill, the former objected that it was not fitting for a commissioned officer to be subordinate to an N.C.O. He claimed it to be an affront "to my Honor and the ranke I hold in his Majisty's servis."[22] Unimpressed Simpson replied as follows:

> Sir,
>
> Your impertinent and ridiculous note of this Evening shall be treated with the sovereign contempt it merits. Your Honour & rank in his Majesty's Service are quite immaterial to me and all I require of you is to do your duty faithfully as a Clerk in the Service of the Honble. Hudson's Bay Coy."[23]

Apparently, Simpson did not expect him to improve his spelling.

In April, 1821, Robert Clouston replaced Greill at Berens River. His staff, in addition to himself, included a clerk, a guide, an interpreter, an Orkney fisherman, two European servants, and eight Canadian voyageurs, for a total of fifteen.[24] This was three more than McAulay's staff the previous year.[25]

One of Clouston's first activities was to relocate the establishment about three miles farther up the Athabasca, at the

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[22] *Ibid.*, p. 240.

[23] *Ibid.*, p. 240.

[24] *Ibid.*, p. 366.

[25] Rich, E.E. (Ed.). 1939. *Colin Robertson's Correspondence Book, September 1817 to September 1822.* The Publications of the Hudson's Bay Record Society, Vol. II. London: The Champlain Society.

mouth of the Red (now McKay) River, where the summer fishery was better than at Berens House and where game was more numerous. This centre was variously known as Red River Post, Bewrens House, and Berens Fort. Apparently, it was abandoned in 1848.[26]

In any event, from 1821 there were no longer eyeball-to-eyeball confrontations with the Nor'Westers on this stretch of the Athabasca. Their Pierre au Calumet post seems to have closed in 1820, shortly after John Stuart entertained Capt. John Franklin on the first of his celebrated expeditions to the Arctic. In 1821, when the two great rivals were amalgamated, peace descended on the river. No significant changes took place in between the Forks and Lake Athabasca until early in 1870, when, as mentioned above, H.J. Moberly established Fort McMurray on the site of a previous post. He named it after a friend and chief factor of the company. Primarily its purpose was not to trade in furs but to be a terminus of a proposed steamboat route that would extend nearly three hundred miles down the Athabasca and Slave Rivers to rapids which begin at Fort Fitzgerald, and up the Peace two hundred and twenty miles to the Vermilion Chutes.

Moberly had his problems, although at first all went well. With the help of his boat crews, available to the end of May, he got a garden planted, logs squared, and built a temporary house for himself, a store, a men's house, and a carpenters' shop. During the following winter, more logs were squared, boards sawn and all preparations made to erect an officer's house. Then one hot spring day, when mosquitoes and bulldog flies were making life intolerable for the horses, Moberly made a smudge to protect the poor beasts from the insects. He then crossed to a little island to work on his garden.

Soon a gale-force wind sprang up. A whirlwind picked up a live coal from the smudge and deposited it on the bark roof of the store, where it burnt through and dropped into an open barrel of

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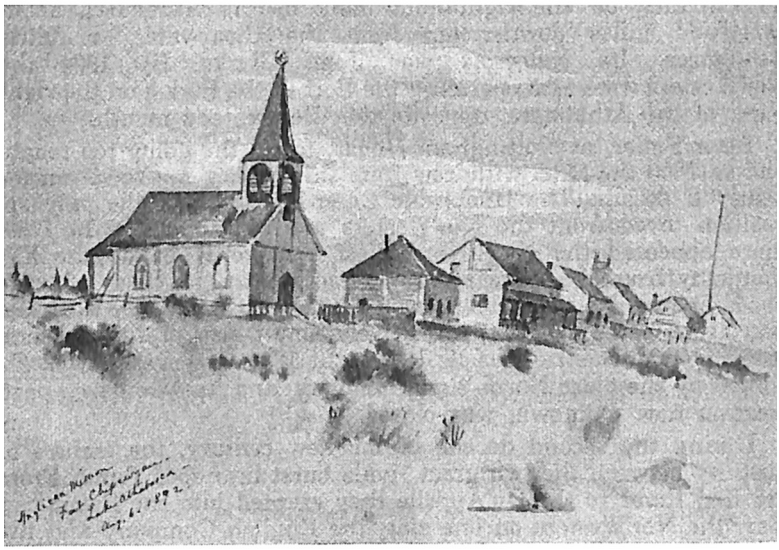
[26] Richardson, *op. cit.*, p. 122.

gunpowder in the attic. With a roar the building blew up, and the resultant fire destroyed store, contents, and all the carefully-prepared building supplies. Moberly was busy for the rest of the summer and all the following winter in rebuilding the store and erecting the other needed buildings, but by the spring of 1872, all construction was completed.



Anglican Mission, Fort Chipewyan, 1892 (Elizabeth Taylor). Minn. Historical Society.

Soon he was given new responsibilities in addition to the management of Fort McMurray. In 1778, Peter Pond and his men carried their canoe and trade goods across the Methy Portage on their backs, but in 1874, when Moberly took over responsibility for this transportation link, the situation had become far more complex. The volume of freight had vastly increased and now moved across the height of land by cart. As Moberly relates:

> The outfits for Athabasca, Peace River, Mackenzie River, and the Yukon all passed here, as well as all the furs, caribou tongues, leather, etc., traded during the previous year.... The boats from Hudson Bay, Red River, Cumberland and Green Lake brought foods from the south; those from Peace River, Peel River, Mackenzie River and Athabasca brought furs.[27]

In 1875, the whole complex arrangement almost ended in failure. The Athabasca, like other northward-flowing rivers, is particularly prone to flooding as the ice and snow in its southerly reaches melts before the lower and more northerly channels are open. The 1875 flood was particularly disastrous, when ice piled up at the forks to heights of forty to fifty feet, and the water rose fifty-seven feet in an hour. Only one of the post's buildings was destroyed, but thirty-six of the thirty-seven draught oxen were drowned.

Moberly immediately headed for Lac La Biche, where he enlisted the aid of the Company officer in charge, W.E. Traill. Together, they bought up every available horse or ox capable of hauling a cart. After thirteen days of heart-breakingly difficult travel, Moberly reached Fort McMurray; another three days found him and his draught animals at Methy Portage. He had beaten the first fur brigade by two days, and the situation was saved.

Fort McMurray had been established as a transportation terminus rather than trading centre, but its bourgeois did not neglect the Company's primary business. Although only two small bands of Cree and Chipewyan traded at the forks—about sixteen or eighteen hunters—each year Moberly managed to secure fourty to fourty-five ninety-pound packs of fine furs. However, he did not have all the Company's business in the area. About 1870, and certainly by 1872, the post at the mouth of the Red was reestablished under the nomenclature of Little Red River. By 1897, it had taken over the principal trade of the locality from Fort McMurray. In 1912, its name

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[27] Moberly, *op. cit.*, p. 151.

was changed to Fort MacKay, in honour of a pioneer Company physician and fur trader, and the Red became the MacKay River. The Honourable Company is still in business there, as it is at Fort McMurray.

A hundred years after Peter Pond passed the forks, Moberly left Fort McMurray. Even in 1778, the proposed steamship service for which he had established the Fort as a terminus was not in operation. Not until 1883 did the *Grahame* make her maiden voyage, presaging the end of Methy Portage as part of the fur trade highway. A new route was found, in or around the rapids on the Athabasca, to Athabasca Landing, then overland to Fort Edmonton, on the Saskatchewan. In time, this route, too, was superseded when the steel of the Alberta and Great Waterways (now Northern Alberta) Railway reached the Clearwater in 1920.

For its first century, the Land of Peter Pond was fur trade country. During the second, increasingly it also became a transportation corridor, a water highway to the high Arctic. As it approaches and enters its third hundred years, its future lies more and more with the fascinating black pitch that Harmon and others noted oozing from the river banks long ago.

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Chapter Five

Steamboats Round the Bend

Riverborne Traffic on the Athabasca

John W. Chalmers

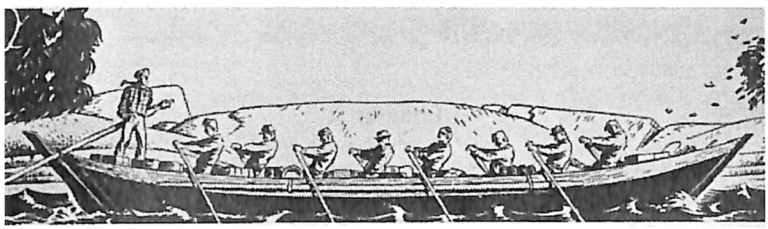
Despite its modest production of fur, for two centuries after discovery by white men, the Land of Peter Pond was more a thoroughfare than a source of wealth. For the first hundred years, trading goods moved north and furs south over the Athabasca River, at first in the graceful North canoes made of birchbark, later in the ungainly but more capacious York boats of the Hudson's Bay Company. Reference has already been made to the fact that in 1870 Henry J. Moberly established Fort McMurray, at the mouth of the Clearwater, to serve as a steamship terminus. However, it was not until some years later that the first vessel, *S.S. Grahame*, pulled away from the dock on its maiden voyage down the river. Built in 1883, its length was 135 feet, beam 24, cargo capacity 90 tons.

Soon a new approach to the north relegated the Methy Portage route to the dustbin of history. Completion of the CPR mainline, and in 1891, the branch to Edmonton, made that centre the jumping-off point to all expeditions down north. Travellers reached the elbow of the Athabasca River, a hundred miles north from Edmonton, by wagon. At Athabasca Landing, they boarded a steamer which took them to the head of the river rapids. Here, they disembarked, walked across an island, and went aboard scows for an exhilarating ride through the white water. At its foot, they embarked on the *Grahame*,

which went all the way to Smith's Landing, now Fort Fitzgerald, before another portage was encountered.

One early woman traveller over this route was Elizabeth Taylor in May, 1892. She describes the cargo being loaded aboard the *S.S. Athabaska* at the Landing.

> Such a variety of packages addressed to such interesting places, tobacco put up in parcels of 65 lbs. each stitched up in dull red painted canvas, boxes of 'Old Honesty' oysters from Mobile, Ala.; neat, strong, polished kegs of sugar for the Catholic Missions, plainer unpolished ones for the H.B. Co.; bales of blankets of 95 lbs. weight from England; sacks of flour, great flat greasy sacks of bacon, boxes of apricots, and canned peaches, and boxes of evaporated fruit.[1]



York boat under oars: Hudson's Bay Company

Her accommodation aboard the steamer was somewhat short of luxurious. Slated for the best stateroom on the vessel, she was 'bumped' by a bishop and a Company chief factor. As she tells it:

> Mine, a single, had a hay tick only as furniture, no toilet articles whatsoever, and no bedding. I unpacked my blankets and went to bed. Had just settled for the night when a big drop fell on my

[1] Nute, Grace Lee. 1948. "Paris to Peel's River in 1892". *The Beaver*, Outfit 278, No. 4: 20.

> nose and then another, I got up, spread the mackintosh over the slats above, and lay down again. But from the pattering above me, I saw that I should soon be deluged, so I rose, balanced myself uncertainly on the edge of the berth, and untied my bag of camping things, placed a frying pan under the leak, and tried to sleep again. But the leaks came faster and faster, and in fact I spent the entire night in warfare with the waters.[2]

Unexpected high water marooned the passengers on the island for a number of days. At last, however, they went aboard the scows for the wild ride through the rapids. As Miss Taylor relates, it was an exciting experience:

> I was not as scared as I expected, except at one place where the boat was let down just to the head of a fall, 15 men behind and 5 in front holding it back with ropes, the men on a slippery narrow ledge where it seemed impossible for anyone to stand. Then it seemed dreadful, like some nightmares I have had but it was over in a few minutes.
>
> I never tired of watching the men of the brigade. As we approached a stretch of rapids, at a signal from the steersman, the great oars would be put in place and with shouts the men would bend to their work—rising to their feet at every stroke, hair flying, spray dashing from the long blades—and the boat would be sent down the current at a speed that outstripped that of the rapids and placed the boat under control of the steersman. Then when we reached a quieter place the oars would be unshipped, and the men would stretch out comfortably on the pieces smoking. I listened in vain for any of the old voyageur songs—not one was to be heard.[3]

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[2] *Ibid.*, p.20.

[3] *Ibid.*, p. 20-21.

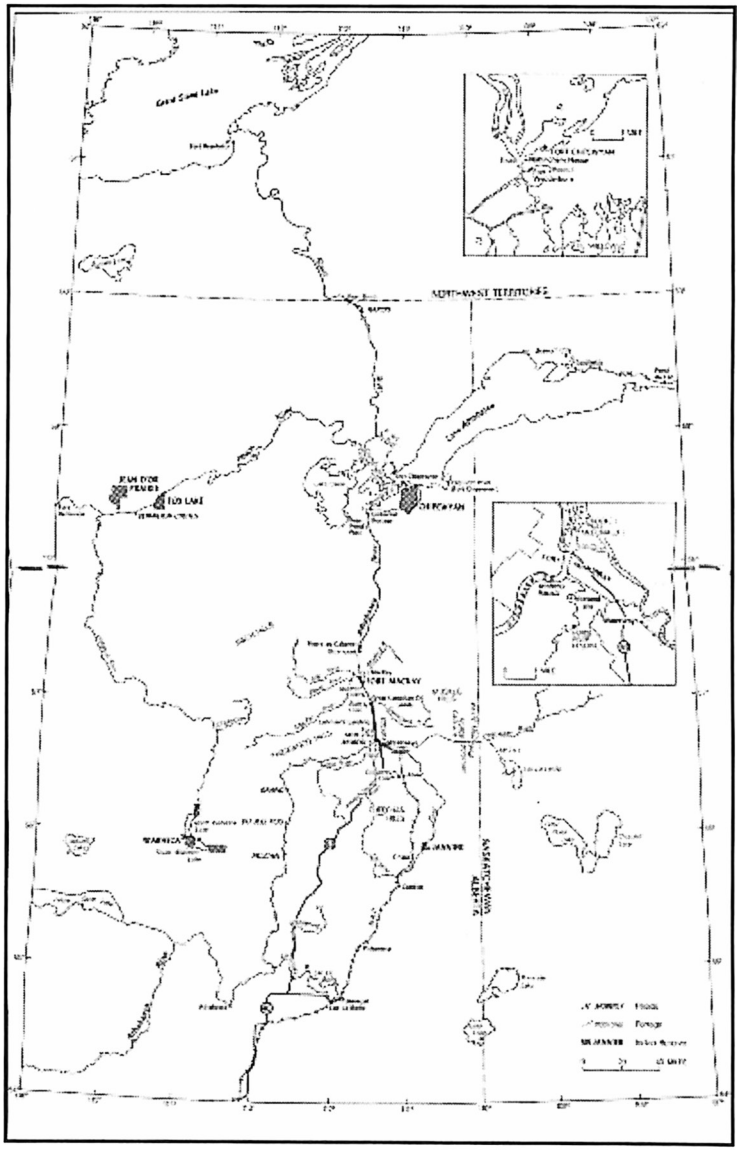

Figure 5. *The Land of Peter Pond.*

She found a great difference going up the rapids instead of down, which she did about three months later. For her it was pleasant, for the boatmen, unrelenting toil:

> The life of the [Athabasca] river is much as it used to be in the old voyageur days, except that the hours are shorter and the stops longer. One is awakened at about half-past four o'clock by the cry from the head guide, "Ho leve! Leve! Leve!" and then comes the sleepy stirring of the men and the fragrant smoke of the balsam poplar, telling that the fires have been lighted; and in less than an hour we have taken a hasty cup of tea, tents are taken down, bedding packed away, and our voyage is resumed. We stop for breakfast half-past seven or eight o'clock and again at noon, at four o'clock and at camping time...
>
> The same sturgeon-head boats of the downward trip were in readiness, loaded with bales of furs. The boats seemed roomy and comfortable without the oarsmen, having one man only at the sweep and one at the prow, with a large pole to keep the boat off the rocks. Six men in harness drew the boat along, a stout leather band passing around the chest and being attached to the main line. The latter was about two hundred feet long and the boat was drawn along the stream at quite a distance from the shore. The motion is delightful, and in good weather nothing can be pleasanter than this way of travelling. One passes near enough to the shore to note the vegetation on the banks, and has freedom to move from place to place on the bales, or lie at ease reading or writing... . The only sound was the low whistling of Baptiste at the helm, with his occasional word to Jules at the prow, or the note of a chickadee or moosebird from the shore. The velvety greenness extended to the very water's edge, where long ranks of small sunflowers grew, with goldenrod and asters, gallium and yarrow, berries of several kinds, and the pink and white bells of the dogbane.
>
> It seemed unkind to feel so comfortable when the men in harness were toiling so hard to pull our craft along. And painful work it was, climbing over the rocks, plunging into water to the waist, scrambling over fallen trees, sometimes climbing over the

> sloping hillsides high above the rapids, and sometimes forced by the power of the rushing waters to give up foot after foot of ground... . Sometimes two crews had to combine... . The men have kept little of the picturesque costume of the voyageur of the old days, only the bright handkerchief on the head, the moccasins, and an occasional fine bag and L'Assomption sash. But their weather-stained clothes had taken on all kinds of faded tints, so attractive to an artist's eye, and with their long unkempt hair and the gay touches of colour in kerchief and sash, the crew were fit subjects for a sketch as they were grouped about the camp-fires.[4]

Available accounts of life aboard the *Grahame* are few. However, Charles Mair, a secretary to the Half-Breed Commission which accompanied Indian Treaty #8 Commission, describes his 1899 voyage from Fort Chipewyan to Fort McMurray:

> On the 9th the steamer *Grahame* arrived from Smith's Landing, bringing with her about 120 baffled Klondikers, returning to the United States, there being still some sixty more, they said, down the Mackenzie River, who intended to make their way out, if possible, before winter. They had a solitary woman with them who had discarded a duffer husband, and who looked very self-reliant, indeed, being girt about with bowie-knife and revolver, but otherwise not alarming.
>
> We ourselves boarded the steamer for Fort McMurray on the 11th, but owing to bad weather, did not get off till mid-day, and even then the lake was so rough that we had to anchor for a while in the lee of an island. Colin Fraser had started ahead of us with his big scow and cargo of furs, valued at $15,000 and kept ahead with his fine crew of ten expert trackers. When the weather calmed we steamed across to the entrance of one of the various channels connecting the Athabasca River with the lake,

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[4] Nute, Grace Lee. 1948. "Down North in 1892". *The Beaver*, Outfit 279, No. 1, June: 45-46.

> and soon found ourselves skirting the most extensive marshes and feeding-grounds for game in all Canada; a delta renowned throughout the North for its abundance of waterfowl, far surpassing the St. Clair flats, or any other region in the East.
>
> Next morning, upon rounding a point, three full-grown moose were seen ahead, swimming across the river. An exciting, and even hazardous, scene ensued on board, the whole Klondike crowd firing, almost at random, hundreds of shots without effect. Two of the noble brutes kept on, and reached the shore, disappearing in the woods; but the third, a three-year-old bull moose, foolishly turned, and lost its life in consequence. It was hauled on deck, bled and flayed, and was a welcome addition to the steamer's table.
>
> That night a concert was improvised on deck, in which the music-hall element came to the front.
>
> By evening we had passed Burnt Point, also Poplar Point, where the body of an unfortunate, called Patterson, who had been drowned in one of the rapids above, was recovered in spring by some Indians, the body being completely enclosed in a transparent coffin of ice. On the following day we passed Little Red River, and next morning reached the fort, a tumble-down cabin and trading-store on the top of a high and steep bank, which had yet been flooded at times, the people seeking shelter on an immense hill which overlooked it.[5]

The Honourable Company never really intended to go into public transportation. Its business was furs, buying and selling them, but inevitably it found that it had to move them to market itself, even though the market might be a continent and an ocean away. Equally, it had to transport its trade goods from their European sources to the little palisaded forts in the North American wilderness.

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[5] Mair, Charles. 1908. *Through the Mackenzie River Basin.* Toronto: William Briggs.

Thus, since it was already in the freight business, it was logical, when settlers and others came to this new land, that the Company should carry them, their mail, and their goods. In operating the *S.S. Grahame* as a common carrier, the Governor and Adventurers were simply following precedents which reached at least as far back as the time of the Selkirk settlers.

The flagship *Grahame* soon became the nucleus of an inland fleet that plied waters throughout the whole Mackenzie basin. In 1939, H.N. Petty reported that Mackenzie River Transport, as the service was known, operated thirteen steam and diesel units in Northern Alberta and Saskatchewan and in the North-West Territories on the following rivers: Peace, Athabasca, Rocher, Slave, Mackenzie, Liard, Nelson, and on Great Slave and Athabasca Lakes.

He also gives the following figures for freight tonnage moved during representative years.[6]

1921	1,300 tons (during drilling at Fort Norman)
1922	700 tons
1929	5,000 tons
1938	13,000 tons north (approx.), 444 tons south

Most of this freight was handled in barges of 40 to 500 tons, of which eighteen operated on the upper river (i.e., above the rapids at Fort Fitzgerald), and twelve on the lower river. Each stretch had one refrigerator barge. In addition, three powered craft and seven barges were used for yarding purposes between Waterways and Lehman's Landing, eight miles downstream. Two shipyards were also in operation, at Tar Island, eighteen miles below Waterways, and at Gravel Point on the lower river.

The steamships were very similar to other steam-powered inland vessels of the era. They were of very shallow draft—"deep water" was not any more than three feet six inches—and some craft could navigate in as little as two feet below their waterlines. They were stern rather than sidewheelers, the better to back off the gravel bars that were a ubiquitous fact of life on such rivers as the Athabasca. They burnt wood, previously cut and stacked at convenient points along the river bank or lakeshore; thus the ships had to make frequent refueling stops. Unlike earlier steamships on the Red and the Saskatchewan, they normally had one funnel rather than two. Typical was the *S.S. Athabasca River*, premier vessel between Waterways and Fort Fitzgerald from 1922. Its overall length was 146 feet; beam 26; draught three. It was built of fir, with engines from Toronto. The *Athabasca River* was equipped with electric lights and a searchlight. Its speed was a dizzying thirteen knots. This vessel could carry 150 tons

[6] Petty, H.N. 1939. "Mackenzie River Transport." The Beaver, Outfit 269, No. 4, March: 48-540.

of freight, and also handle a 200-ton barge. Saloon accommodation was provided for 58 passengers.

The *Athabasca River* replaced the *Fort McMurray*, laid up in 1921, which in turn had superseded the *Grahame* at an earlier date. Philip Godsell has given us a brief description of a 1920 journey in the *Fort McMurray*:

> ...we boarded the stern-wheeled river steamer *Fort McMurray*. Soon we were wending our way past the tar sands and into the wider and more heavily wooded stretches of the Athabasca River, while ever and anon Captain Haight, resplendent in nautical cap, gold braid and brass buttons, loudly bellowed orders from up on the Texas deck. Nobody except the few lady passengers were impressed by the old fellow's noisy ostentation, least of all the half-breed crew who often yelled derisively back.
>
> Early in the morning of the third day we made our way out of the shallow marshes at the mouth of the river and commenced to traverse the beautiful sketch of island dotted waters known as Lake Athabasca. It was a perfect day, the water as blue as saphire, and not a sound was to be heard but the thud, thud, thud of the paddle wheel and the screaming of the white seagulls who followed in our wake.
>
> Soon we were beneath the towering rocks upon which the red-roofed white painted Fort Chipewyan stood sentinel. There was something un-utterably commanding and tranquil about this spot which had witnessed the last chapter in the bitter struggle for supremacy in the fur lands.[7]

Twenty years later, another inland voyageur, Josephine Robertson, travelled the same route aboard the *Northland Echo*. (It was originally built in 1908 as the *Midnight Sun* to operate on the upper Athabasca. Later it was run through rapids, rebuilt, and renamed.)

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[7] Godsell, H. Phillip. 1934? *Arctic Trader*. London: Travel Book Club.

At Waterways, end of the railway line from Edmonton, the Hudson's Bay Company—which until then had been for us a formidable name in history, or a blanket of extra quality—came to life in the person of H.N. Petty of Mackenzie River Transport. By him we were led to a hearty Canadian breakfast aboard the *S.S. Northland Echo*, which lay below in the Clearwater River.

Afterwards, we inspected the neat white ship, fragrant with the spruce logs in its hold, and watched the freight come down the conveyor belt, as men loaded the barge which was bound north with us.

We walked among huge disks for crushing rock at Goldfields, saw men roll oil drums down the river bank onto barges as if they were bowling, visited a company engaged in tapping the vast salt deposit under the town, and another which extracted oil from the black, tarry oil sands that outcropped along streams of the vicinity. It seemed that here at railroad's end we were at the edge of the land of the future, toward which civilization was making its first tentative move.

The sun shone gloriously next day. When it was still high our stern wheel began to turn, the smoke stack puffed rhythmically, and we backed slowly away to the confluence of the Clearwater and the Athabasca. There we picked up a second barge and, swinging around, headed down toward Lake Athabasca.

I noted that instead of keeping to the centre of the river, as seemed to me reasonable in order to avoid hitting the banks, our boat zigzagged constantly, heading for one shore, then the other. Captain Owen Browne explained patiently that we were dodging sand bars.

Evening loitered in calmness and beauty, with spruce spires and clouds and late-flying birds shadowed on the water. At midnight a fog arose, so we tied to a tree until light came.

Crossing the end of Lake Athabasca, we came to Fort Chipewyan, a little white town perched on a red hill of pre-

> Cambrian rock, whose crannies were studded with bright wild flowers.[8]

These inland voyages may have been pleasant interludes for passengers but the operation of the Company's fleet of river and lake vessels was often difficult and always worrisome for both the crews and the land-locked staff. The latter usually arrived from Winnipeg, and later from Edmonton, in April; the first departure north occurred about May 10 to 15, immediately following the break-up on the river. The shipping season lasted until about October 20 or 25. But ice, fire, and water (too much or too little) could play hob with the most careful plans. For instance:

> Navigation for the season 1933 has now closed and it is to be hoped that never again will so much misfortune be met with in a single season. The ice in the spring 'went out' with a rush and extensive damage was done to buildings at Waterways, Fort Fitzgerald and Fort Smith, and to piles of cut spruce which are stacked along the riverbanks for use by wood burning steamers. Fire also played havoc with our property and warehouses at Fort Fitzgerald in May and Fort Smith in September were razed to the ground.[9]

The 1936 season started out inauspiciously:

> The ice broke up at Peace River town on the 27th (of April) without incident.

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[8] Robertson, Josephine. 1941. "By Sternwheeler to the Arctic." *The Beaver*, Outfit 271, No. 1, June: 4-5

[9] 1933. "The Fur Trade–Mackenzie River Transport." *The Beaver*, Outfit 264, No. 3, December: 58.

> Our agency at Waterways, however, was not so fortunate, the ice in the Athabasca breaking unexpectedly at Fort McMurray early on the morning of April 22. The ice of that river was pushed up the Clearwater River for a distance of four miles from its mouth before it jammed, packing the river solid with large cakes of ice. In a few hours the warehouse was flooded to a depth of over three feet, doing much damage to the freight (some hundred tons) stored awaiting shipment to the North. Frantic efforts were made to save as much as possible but the water rose with such rapidity—and the warehouse started to float in places—that the work had to be abandoned. By noon practically the whole settlement was under water, and much damage was done to buildings and contents.[10]

The season ended on a note almost equally sombre:

> The unusual rush of freight at the end of the season, and storms, involved the risk of some boats being frozen in.... the *Pelly Lake*, *Canadusa*, and the chartered tug *Saskalta Queen* arrived at Tar Island shipyard, eighteen miles below Fort McMurray, with three hours to spare before the ice closed in. The crews walked the remaining distance to Fort McMurray.[11]

If floods presented some hazards, low water occasionally created others. In 1939, the *Athabasca River* had trouble clearing the bar at the mouth of the Clearwater, and was able to do so only when lightened to draw not more than two feet of water. Even then she scraped bottom; and on July 16 was replaced on her regular run by the shallow-draft *Northland Echo*. However, a government vessel was set

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[10] 1936. "Mackenzie River Transport." *The Beaver*, Outfit 267, No. 1, June: 61

[11] 1936. "Mackenzie River Transport." *The Beaver*, Outfit 267, No.3, December: 59

to work to dredge a new and deeper channel. In 1951, the *M.S. Pelly Lake* because of low water, took seventeen days instead of the usual three to reach Fort Fitzgerald from Waterways. As a result, it was not able to return to its home port and was frozen in for the winter at the northern terminus.

Low water was also a constant threat at the delta of the Athabasca, where freight occasionally had to be lightened from the heavily-laden barges to deeper water on the lake, as in 1938.

Frequently, freight movement was delayed by problems on the railroad from Edmonton. In 1935, heavy rains stopped all train movements from July 30 to August 22, with the result that the Waterways warehouse was congested with a thousand tons of freight when service resumed. Two years later, forest fires destroyed seven railroad bridges, causing considerable delay.

Another threat to the Athabasca River operation was less serious. In the depression year of 1932, the Peace River Board of Trade applied to the railway commissioners for the abandonment of the Waterways railroad line, so that all northern traffic would go through its town. When the commissioners stated that for technical reasons they could not entertain the application, the abashed entrepreneurs from the Mighty Peace had the grace to withdraw it.

On the eve of World War II, Mackenzie River Transport was moving a great variety of freight to its northern terminals. The service's anonymous correspondent reported:

> From the time of the spring break-up the transport fleet has been rushing supplies to Hudson's Bay posts and customers down north. Outboard engines, flour, sugar, and canned goods have made up regular cargoes, while special shipments of fresh goods have been carried by the two refrigerator barges. Tankers have taken thousands of gallons of fuel oil and gasoline to the mines.[12]

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[12] 1939. "Mackenzie River Transport." *The Beaver*, Outfit 270, No. 2, September: 54

During World War II, river transport on the Athabasca and other northern waterways increased enormously, as it did on the NAR. Mackenzie River Transport did not handle all the freight, however. Before the war, Consolidated Mining and Smelting had operated their own *Porphyry* between Goldfields and The Willows, on the Athabasca delta, but the Hudson's Bay Company took it over in the summer of 1939. In 1931, two Edmonton businessmen had established Northern Waterways, Ltd. with a small wooden tugboat and two tiny barges, to operate between Waterways and Aklavik. Three years later, it became the Northern Transportation Company. In 1936, the company was acquired by Eldorado Mining and Refining Ltd., to assure service to its own mine at Port Radium. However, it still remained a common carrier, and, like HBC's Mackenzie River Transport, during the war years, it performed Trojan service for such ventures as the abortive Canol pipeline.

The post-war era saw many changes in northern transportation patterns. First a truck road (often passable only when frozen in winter), then the Mackenzie Highway, and finally the Great Slave Lake Railway made Hay River the principal inland port for waterborne freight to the Arctic, with subsequent diminution in traffic through Waterways. In 1947, Mackenzie River Transport withdrew from the lower river, leaving Northern Transportation dominant on that waterway.

Passengers, too, were turning more and more to other carriers, principally aircraft, although the day would come when one would be able to travel quickly and effortlessly by highway bus from Edmonton to Fort McMurray, or to Hay River and Yellowknife. Thus in 1947, both the venerable *S.S. Athabasca River* and the *S.S. Northland Echo* were retired. The former, flagship of the fleet, had been launched in 1922; the latter was somewhat older. Their role was assumed by the new *M.S. Pelican*, built in Edmonton and assembled at Fort McMurray. Thus, as on the railroads, the glamorous age of the steamer gave way to the unromantic era of the diesel.

When the *Pelican* slid down the ways, Mackenzie River Transport still had a decade of existence before it. It had already surrendered the lower river, the Mackenzie, to its younger rival, and in 1952 it closed down the Peace River operation. In the same year, the *M.S. Pelly Lake* took over all operations on the Athabasca, with another vessel, the *Slave River*, being delegated to reserve status only. However, early in the season it was chartered to Northern Transportation. And in January, 1958, MRT sold all fixed and floating equipment to its chief competitor. After seven decades, the Hudson's Bay Company ceased to operate as a common carrier in the Mackenzie basin.

Table 3. Northern Transportation's Freight through Waterways

	Tons of Freight Moved	
Year	**North**	**South**
1957	134,174	10,458
1958	168,528	13,426
1959	119,204	8,167
1960	85,077	16,650
1961	75,383	11,096
1962	62,235	13,941
1963	61,699	12,534

The new giant of the northern waterways, like all giants, started small: one tug and two barges in 1931. In 1944, the parent company, Eldorado Mining and Refining Ltd. (now Eldorado Nuclear Ltd.), became a federal crown company, and so Northern Transportation passed into public ownership. The reason, of course, was that Eldorado's operations in mining uranium, once a useless by-product in the production of precious radium, had becomevitally important for the highly-secret Manhattan Project that resulted in manufacture of the first atomic bombs. The Cold War of the Fifties sustained the demand for the exotic metal, and NT built new powered vessels and barges to move the ore from Lake Athabasca to Waterways. At the end of the decade, however, lessening world tension and newly-discovered American sources brought the uranium boom temporarily to an end. Five mines near Beaverlodge, Saskatchewan and the one at Port Radium, N.W.T., went into mothballs.

However, this slump was short-lived. Northern activity of all types soon accelerated with defence construction and supply for the now-obsolete DEW-line, oil exploration in the high Arctic, both in Alaska and in the North-West Territories, and renewed interest in uranium, not for bombs but for the generation of electricity. The vessels in reserve were put back into service, and new ones built. From the mouth of the Clearwater, NT's tugs push all-steel barges to Fort Chipewyan, the whole length of Lake Athabasca, and by special arrangements, to the now-deserted Fort Fitzgerald or up the Peace. As its publicity proudly states, "from Waterways, N.T. has shipped North everything from a wedding dress in a cardboard box to a 50 ton piece of machinery." Its vessels are equipped with two-way radios, radar, and echo sounders, and its base at Waterways is connected to the rest of the world by Telex.

The scope of Northern Transportation's freight movements through Waterways, both before and after the opening of the Mackenzie Highway to Hay River in 1960, is indicated in Table 3.[13]

During the early Sixties, Northern Transportation was moving as much freight south as Mackenzie River Transport did north in its best pre-war years. Truly, Athabasca River navigation had come a far piece since Peter Pond turned his little canoe flotilla down that unknown river in 1778.

[13] 1965. *Survey of Fort McMurray.* Edmonton: Government of the Province of Alberta, Department of Industry and Development.

Chapter Six

The Muskeg Flier

The Alberta and Great Waterways Railway

John W. Chalmers

In his story entitled *My Remarkable Uncle*, Stephen Leacock tells how this incredible relative of his became secretary-treasurer of a Manitoba-chartered concern named the Winnipeg Hudson Bay and Arctic Ocean Railway. Although it never laid a mile of track, it printed some impressive stationery and complimentary passes which were bestowed on senior personnel of railroads all over North America. Those concerns reciprocated the courtesy, so that the Remarkable Uncle was able to travel free wherever he wished—until the true nature of the WHBAOR gradually became apparent.

If the Eighties were the gilded age for new railway companies in Manitoba, the corresponding period for Alberta was the first decade of this century. As L.G. Thomas notes, "By the end of 1913 the legislature had authorized the guarantee of 3,336.87 miles and executed the guarantees on 2,282.8 miles."[1] It was these bond guarantees, usually at about $20,000 per mile, which made railroad-building so attractive to speculators. With perhaps as little as $50,000 of their own money, they could secure a charter from the province

[1] Thomas, Lewis G. 1959. *The Liberal Party in Alberta: a History of Politics in the Province of Alberta, 1905-1921*. Toronto: University of Toronto Press, p. 151.

and use Alberta's credit to finance construction. Shares would be issued and offered to the public for further funding, some of these shares representing the promoters' original investment. The directors would also issue themselves additional shares for dreaming up the whole scheme, thus recovering, hopefully, their first $50,000 and much more. There were other legal, if somewhat unethical, schemes for milking a young railroad company, and certainly there was more and faster money in building than in running such an enterprise.

Even with the backing of the province, not all such schemes were successful, at least as far as building a railroad. Like the Arctic Ocean Railway, some never laid a tie or a rail, and others failed by some distance to reach their intended destinations. Among the latter was the Edmonton, Yukon, and Pacific irreverently known from its initials as the Ever Young and Puling. Before running out of steam, it did in 1902, manage to struggle across the Saskatchewan from Strathcona (South Edmonton). Ultimately it became a seven-mile link between Canadian National lines on the north and south sides of Edmonton. For many years it shared the single deck of the narrow Low Level Bridge with street-car and other vehicular traffic. Sometime after World War II, most of its rails were torn up, but even today a vestige of the one-proud EY&P serves as a spur line to a south-side packing plant.

Naturally, pioneer Albertans had to have a railway to the Land of Peter Pond. As early as 1905, J.K. Cornwall, known to his contemporaries and to posterity as Peace River Jim, had secured a federal charter for his Athabasca Railway Company. However, under the provincial *Railways Act*, a new concern, the Alberta and Great Waterways Railway, was incorporated in 1909, with the usual bond guarantees, which Cornwall had not secured from the federal government. For due and adequate consideration, then, he transferred his Athabasca Railway rights to a new corporation, the Canada West Construction Company, apparently a subsidiary of the AG&W.

For many years the AG&W's fate was embroiled in provincial politics, as charges of sharp practice, chicanery, political favouritism, malfeasance, and corruption filled the air. In his *The Liberal Party in Alberta*, L.G. Thomas has told the story of the political and other wheeling and dealing which delayed construction of this Road to the North, so that it is unnecessary to repeat it here. However, after a change of ownership, the line reached Lac la Biche in 1916, and the Clearwater River nine years later.

The transfer of ownership in 1913, to the J.D. McArthur Company, was not the last. Even before construction was finished in 1920, the McArthur group were in such serious financial trouble, as a result of World War I disruption, that the province had to take over, complete, and operate the line to protect its own investment. At the same time, Alberta assumed possession of a McArthur railroad serving the Peace River country. This was the Edmonton, Dunvegan, and British Columbia which, incidentally, never reached either Dunvegan or the Coast Province. The last fourteen miles of access to Edmonton by the AG&W were over the ED&BC.

Thus in 1920, the Foothills Province found itself in the railway business. Its property was hardly up to transcontinental standards, as the following account indicates:

> We reached Edmonton from Ottawa on June 2, but waited twelve days for the first train north. When we finally got away on June 14, it was on a train that for novelty stands in a class by itself. It was a combined freight and work train, with an old mail coach attached. The mail coach had seating capacity for fourteen people. This was absolutely all the passenger accommodation —no sleeper, diner, or washroom.
>
> There was quite a party going to the oil wells at Fort Norman that year, and what with Mounted Police, tourists, missionaries, and Hudson's Bay Company men, the passenger list numbered sixty-seven, but none of us were very old or fussy. Several were just married and ready for adventure, so we cheerfully piled our personal baggage, bed rolls, and tents into

the open coal car, and climbed in on top ourselves. We carried along our own food, and got hot water for tea at the stations en route. This railway was built over muskeg, when the ground was frozen. A work gang repaired the track as we went along. In the first sixteen hours we made one hundred miles. We took no chances travelling after dark. The train stopped for the night, and we were able to get out our bed rolls and mosquito bars and make a sleeping camp alongside the track. In the morning there was plenty of time for the men to shave while the women prepared breakfast. Our big difficulty, next to the mosquito pest, was to find drinking water. Unless the train stopped near a creek, we had to scoop up water from the ditch or between the 'nigger heads." We told each other, it did not taste so bad in tea. Actually, it was the colour of tea and we did get so thirsty.

The train crew were most obliging. If we came to a place where the fishing looked good, or ducks were plentiful, we might try our luck. Time was of no importance at all.

Arriving at Lac la Biche midnight, June 15, we found accommodation inadequate. A hotel of sorts was being constructed, but the two women who took a room said they were too frightened to sleep. The room had no door, and there were so many strangers round. A number of us made ourselves as comfortable as we could on the train. We got practically no sleep. The situation was comical. Here we were, first class passengers, travelling down to the Arctic by the approved and only way, and getting the best to be had en route. Things would quiet down, and we would try to snatch a bit of sleep, when someone would shout to be sure to leave our shoes out to be shined. Or someone else would decide to play porter and make himself a nuisance.

Next morning we were all up early and pitched our tents. There were several washouts down the line, and no one knew when we might be able to get away. The weather was very bad while we were at Lac la Biche. It rained continually, and was warm and sticky, with clouds of vicious mosquitoes. My husband's face was swollen with bites. We spent most of our time under mosquito bars reading. There was nothing else to do, and the rain came down in torrents.

On June 18 word came for anyone in a hurry to get down north to be at the station by 9 a.m. Mickey Ryan would take a load of passengers on his speeder. We were to take only necessary baggage as the space would be very limited. We ran to the station bag and baggage, but so many of us were in a hurry, and we all had so much necessary baggage, that poor Mickey was swamped and told us we had better wait for the train, which would probably start next morning. We slept in the hotel that night. The ground was so soggy that once we had broken camp we could not pitch our tents again.

Next day about 1 p.m., we were off again, though not exceeding any speed limits, even for that day and age. As the train passed over it the track at times disappeared altogether in water. Occasionally the ties snapped under the strain. We were bounced up and down and from side to side. In one spot the track was so bad the cars kept uncoupling. Once we were off the track altogether. We made many stops for repairs, and of course always built a fire and made tea.

When the nights were fine and the ground not too wet, we spread our bed rolls by the side of the track. Sometimes making a bed of evergreen boughs and with our bars for protection from the mosquitos, we had a comfortable night under the stars. But when it rained or the ground was very wet, we slept aboard. The rain made it very unpleasant, for we had to protect ourselves and belongings as best we could with tarpaulins and tents spread out.

Long before we arrived at the end of steel on June 23, our food was gone. The fortunate few who had food were sharing with those who had not. And we had many a meal with the work crew. At places where we stopped, the water was so stagnant and slimy we could not even make tea. Sometimes when walking the "nigger heads," our feet slipped and down we went into the water to our knees. One day we walked along the track a couple of miles to a lovely little creek, put up our mosquito bar, and wrote our letters. When the train came along we got on as it passed. One day, we travelled five miles; another day, three.

Finally at 3:30 p.m. June 23, we arrived at the end of our train journey. Mickey took us a few miles further on his speeder

(a Ford chassis with a trailer, that rode the rails). The seats were back to back, so the passengers in the back seat did not see the road until after they had passed over it, which was probably why I got a back seat. This part of the track, even our fearless train would not tackle. We went over a very shaky, high, trestle. I kept my eyes closed most of the time, too frightened to look.

My husband said that when he came out in 1919 the track was in even worse condition, and that over a bridge crossing the Christine River they were told to walk and go single file. The ties and rails were holding the supports in place and the whole thing swayed very badly. Sometimes they had to get down on hands and knees where ties were missing. They looked back to see what the train was going to do about it. One trainman walked across the bridge and waited. The other started the train very slowly and then jumped off, letting it cross alone. When it arrived, the first trainman jumped on and stopped it. After hearing this story, we felt that conditions had certainly improved.

Mickey entertained us to breakfast one morning. It consisted of hot cakes, bacon and marmalade. What a breakfast! These sour dough hot cakes, made right on top of the stove by the men of the north, have no equal anywhere.

On June 26 we broke camp and packed our baggage half a mile through mud and water down a very steep zigzag gumbo trail to the Christine River. We loaded our stuff into a canoe and paddled the twenty-four miles down the beautiful winding Christina River to Fort McMurray.[2]

It is interesting to note that the writer's voyage down the Christina was along the route of Turnor, Fidler, and Ross in 1791, when they were the first white men to follow it.

Under provincial ownership, the line lurched towards its terminus. In 1922 it reached Draper, three years later it came to the

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[2] Hoard, Catherine. 1938. "Edmonton to Aklavik, 1920." *The Beaver*, Outfit No. 269, No. 1, June: 40-42.

banks of the Clearwater, three miles above Fort McMurray, where a new centre, named Waterways, soon sprang into existence.

The province was never really happy being in the railway business, and during the Twenties made repeated attempts to sell its holdings. In 1929, a company called the Northern Alberta Railways was formed by the giant Canadian Pacific and Canadian National. The new organization took over both the ED&BC and the A&GW. It immediately took steps to upgrade its property by laying heavier steel, purchasing larger locomotives and other rolling stock, and making other improvements. A journey from Edmonton to Waterways, however, still remained an adventure, as the following account by Eric Munsterhjelm of a trip in the Dirty Thirties would indicate:

> The 'Muskeg Flier' is famous all over the north. It makes one trip a week over its three or four hundred miles of track between Edmonton and the town of Waterways on the banks of the Clearwater River, a tributary of the Athabasca. Waterways is the southernmost port of that great system of rivers and lakes which comprises the Mackenzie basin.
>
> The train consisted of about ten antiquated freight cars, with a wooden passenger coach from the last century attached to the rear. This cavalcade of relics was pulled by a locomotive which panted and trembled, not from eagerness, but from age.
>
> When the train had started and we had made ourselves at home—comfortable is hardly the proper word for it—I studied the surroundings with interest.
>
> Half a century before, the coach might have been the pride of some transcontinental crack train. Decorated bronze lamps hung from its ceiling, its walls were of mahogany panels framed by carved mouldings, and the upper parts of the windows were stained-glass mosaic set in lead. One could picture how, fifty years before, frock-coated gentlemen had attended bustled ladies with smiles and flattery.
>
> Now the car resembled a bedraggled down-at-heel aristocrat. The panels and windows were cracked, the lamps

spotted with verdigris, and everything was covered with a film of grime, except those parts of the benches where the seats and backs of passengers had rubbed it off. In one end of the car a set of benches had been removed to make room for a pot-bellied cast-iron stove and a rough fuel-box.

There were about a dozen other passengers in the coach: homesteaders, trappers, and lumberjacks, and a couple of women. While I looked them over I noticed a thin-faced, bearded man who stared at me intently. I looked away, but when I glanced at him again he was still staring at me. Finally, when I gave him an annoyed glance, he came over and sat down beside me.

'You are from the outside,' he said accusingly.

It was not so much a question as a statement. I nodded, annoyed at being so easily recognized as a greenhorn. He continued hastily:

'Don't be sore. I knew you must be one. Nobody but a tough old-timer or an unsuspecting newcomer would dare make this trip. There are terrible experiences in store for you.'

He looked with satisfaction at my startled expression before he said:

'You see, a trip on this train is something of an initiation to the north, a test of courage and stamina. The mere thought of it keeps the chicken-hearted away from those rigours of the north that really test the fitness of a man. Anybody that survives a trip on the 'Muskeg Flier' will have little trouble later.

"The average speed of this train is about four miles an hour, and that is about all a normal person can stand, anyway, without being shaken to death. In the summertime you can jump off the first car and pick a lard-pail full of blueberries in the bush alongside the track and still have lots of time to catch the last car as it passes by. In the winter the train crew run a trapline along the right of way and stop when they please to tend their sets. That is all right with most passengers, because it gives them some relief from the terrible shaking and jumping they have to endure when the train is moving.

'If it wasn't for that, only a person with the patience of an Indian fakir to watch a certain spot for several minutes would be able to tell if it is moving at all.'

The stranger interrupted himself for a moment to give me a searching glance. A look through the window assured me that we were moving all right.

'Nobody cares much if the train is only a day late. But once, when it had not showed up in Edmonton a week after it was supposed to, some impatient, prospective passenger phoned the railroad people and asked if he would be able to go north that year. The officials, alarmed at the possibility of losing a passenger to the aeroplane company, started hustling. They were very relieved when a farmer, who had driven into town in his buggy, told them that the train was coming all right because he had seen it pass his place on its way south a couple of days before. And, sure enough, it arrived the next day.'

The man stopped only to spit at the red-hot stove. I had by now decided that I was listening to a descendant of Paul Bunyan. He went on:

'The "Muskeg Flier" had a peculiarity which is perhaps a world's record. It is the only train in the world that always, and in both directions, is travelling uphill. You see, the track is laid mostly on endless swamps and muskegs that sink when the train passes; so that the locomotive is forever desperately climbing out of the mire like a drunk trying to crawl out of the gutter. So as not to lose their train altogether, the railroad people have welded the rails together and tied a red-painted gas drum to the engine with a long rope, in the hope that the drum will float if the train sinks out of sight. It's lucky for us passengers that they haven't found out yet if the device works.'

My narrator stopped to spit once more and put another lid full of snuff in his mouth. He had now armed up to his story.

'Yes,' he said, 'the line has never been completed. Maybe the builders figured that they would never be able to reach the Arctic Ocean, anyway, so what was the use of trying? So they stopped construction, and the track ends abruptly miles from nowhere. After all, it had to stop somewhere. Who cared where?'

> The fellow got really going now. With hardly a breath he rattled on:
>
> 'And the climate in this car is the most varied in the whole world. When it is real cold, women and children freeze to death in one end of it while their men-folks are roasted to death in the other. They can't go to their rescue, anyway, because the car is jumping around like mad so that nobody can stand, walk, or crawl. I lost my old woman and kid that way.'
>
> He stopped and dried a tear out of his eye. I yawned loudly, and, with a disappointed expression, he went back to his seat. After this I tried to sleep, but I only froze my toes and singed by hair. I could not sleep, anyway, because that fellow set up an infernal wailing and moaning and claimed the railroad had broken his leg. Karl said we shouldn't judge him too harshly, as he had probably had his wits shaken out of him on some earlier trip.
>
> After that the journey proceeded uneventfully, and soon we arrive in Waterways.[3]

Many reasons other than that advanced by Munsterhjelm's fellow-traveller have been propounded to explain why the railway never reached Fort McMurray. One is that as long as it was unfinished it was allowed to charge construction rates on all freight, considerably above the usual levies, and so the line was never completed.

The real reason is less devious. The line was not built to serve the little village of Fort McMurray but to carry freight and passengers to the high Arctic, and the relatively placid Clearwater provided a better transshipment harbor than did the more unpredictable and erratic Athabasca.

Throughout the Thirties the railroad quietly fulfilled its primary function, serving as the first link of a transportation system from

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[3] Munsterhjelm, Erik. 1953. *The Wind and the Caribou: Hunting and Trapping in Northern Canada.* London: George Allen & Unwin, pp. 9-12

Edmonton to the mouth of the Mackenzie. It carried freight for northern schools and missions, for government offices and surveys. It moved equipment and supplies for the oil development at Norman Wells, the gold mines near Yellowknife, and for the radium and other projects in Saskatchewan north of Lake Athabasca. It moved trade goods north and furs south. And of course from Lac la Biche south it provided the usual railroading services for normal farming communities.

Suddenly, all this business-as-usual changed. With the entry of Japan into World War II, Alaska became North America's northwestern bastion of defence, and both the ED&BC and the A&GW lines of the NAR became in effect military railroads, continuing as such after the cessation of hostilities and during the Cold War era. Thus on March 1, 1942, the NAR on both lines was using 16 locomotives only. By January, 1943 the situation had changed.

> The services of 41 locomotives were required. With this increase in train service, sidings and other facilities were found inadequate and necessitated installation of new water supplies, coaling plants, wyes, sidings and the renewing of old ones... . As a comparison the total carloads handled in and out of Edmonton during the year of 1941 was 23,898. In 1943 this had increased to 47,226 cars, and in 1955 to 54,130 cars. Also during 1942 and 1943 special passenger trains were operated to handle American troops and workmen, in addition to our daily service.[4]

The above statistics, of course, refer to the total system, not just the northeastern line.

For awhile, about 1960, when the federal government decided to build a railway to the North-West Territories, it looked as if the

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[4] n.d. *A Brief History of the Northern Alberta Railways Company.* Edmonton: Northern Alberta Railways Company, p. 4

steel might run through the whole of the Land of Peter Pond. After careful study, however, it was decided to build up the west rather than the east side of Alberta. Thus the Great Slave Lake Railway was constructed from Roma, near Peace River, to Hay River, on Great Slave Lake. A branch extended to Pine Point, whose rich lead-zinc deposits were the principal justification for the new railroad. The GSLR was completed in 1964.

The choice of the western rather than the eastern location of the GSLR made little difference to the NAR; either way all rail freight to or from the Territories travelled over its lines for the first (or last) 300 miles from Edmonton. But the choice had a profound effect on traffic through Waterways. All freight to the high Arctic by the eastern route involved three transshipments: at Waterways from train to river transport, at Fitzgerald from boat to truck (to portage around the Slave River rapids), and at Fort Smith from truck back to steamer or barge. The western route, however, involved only one transshipment, at Hay River, with considerable reduction in costs.

Nevertheless, on a reduced scale Waterways still remained a freight centre. But it no longer handled cargoes for the Mackenzie River points; its shipments were destined for Fort Chipewyan, Uranium City, Fond du Lac, and other points on Lake Athabasca. However, before the Sixties were out a new source of business emerged. This resulted from the initial exploitation of the fabled tar sands by Great Canadian Oil Sands, a development that rapidly converted Fort McMurray–Waterton from a pair of depressed hamlets to a thriving town on the way to becoming a city. As the Sixties gave way to the Seventies, further tar sand developments loomed in the near future, with promise of still more work ahead for the *Muskeg Flier.*

As J.B. Armstrong indicates, not all of the colour and excitement associated with travel on the old E&GW have gone. The following are extracts from his account of a 1972 journey to the Land of Peter Pond:

Every Sunday and Wednesday evening at five o'clock a mixed train of the Northern Alberta Railways leaves Edmonton and heads north. Its destination is Fort McMurray, largest settlement in northeastern Alberta, site of the Athabasca tar sands, and jumping-off point for the Northwest Territories. Because of an overnight stop in Lac la Biche, one hundred and twenty-five miles up the line, the train does not reach Fort McMurray until late the following afternoon. There it drops off the cars that it has brought north, and assembles a new train for the return trip to Edmonton.

Few people ever ride the train between Edmonton and Lac la Biche since there is a bus that makes the trip in just over three hours, half the time required by the train. Between Lac la Biche and Fort McMurray, however, no highway comes within thirty miles of the railway, and the train is filled with Indian and Metis people travelling to and from the small settlements along the way.

One Sunday in June 1972, I boarded the train with a round-way ticket to Waterways in my pocket. Within minutes we left Edmonton behind and were out in the open country. Everything was green after the heavy rains of the past few weeks. As we approached the Sturgeon River, a tributary of the North Saskatchewan, I had my first full view of the train. It was stretched out around a long curve and I could see from one end to the other. In the lead were two twelve-hundred-horse-power diesel-electric locomotives, each painted smartly in blue and grey with a yellow band around the middle. Immediately behind them was a string of empty flat cars. They were the first cars to be dropped off and were going as far as Egremont, forty miles up the line. They were followed by some box cars, most of which were from the Canadian Pacific Railway. One sported the CPR's new red, white, and black colours which contrasted sharply with the traditional maroon of the other cars. There was another flat car, this one loaded with Massey Ferguson farm equipment and bound for Boyle. Next came the tank cars. There were twenty-eight of them in all, half the entire train. The gasoline and fuel oil they carried was to be transferred to barges at Waterways and shipped up to the Northwest Territories by way of the

Athabasca, Slave, and Mackenzie Rivers. Following them were a few more box cars, all heading to Waterways. Bringing up the rear was an empty way car and a large, old-fashioned baggage car, and caboose-coach No. 307.

Being alone enabled me to be inquisitive without feeling self-conscious. No. 307 was an unusual car and worthy of close inspection. Apparently, it was built as a coach, probably fifty years ago, but was converted at some point to carry crew as well as passengers—the former in considerably more comfort than the latter, as I was soon to discover. The interior of the car was divided into two sections by a partition with the crew's quarters facing forward, thus giving the conductor and brakeman easy access to the baggage car. Apart from an occasional coat of paint the passenger section looked as though it had remained unchanged since the car was new. The seats were hard and uncomfortable. At the back stood a large oilstove which must be the most important feature of the car during the winter months when the temperature drops to as low as -50° F. Across the aisle from it was a small basin that was fed by a water tank which hung from the ceiling. Along the wall were kerosene lanterns whose shiny appearance gave the impression that the electric light fixtures above them no longer served a purpose. All in all, the interior decorators of No. 307 had sacrificed comfort and convenience for utility and durability.

Shortly before we reached Carbondale the conductor came back to get my ticket. He was dressed as a railwayman should be—in hickory-stripe denim overalls and an engineer's cap. He was friendly and polite, and upon learning that I would be riding his train all the way up the line and back, invited me to join him and the brakeman. Gladly relinquishing my hard seat I followed him forward. What the passenger section lacked in warmth, the crew's section more than made up for. It was an inviting place, a curious and fascinating mixture of the professional and the domestic—a business office combined with a kitchen, dining-room, and bedroom. At the centre of the car, just inside the partition, were bay windows which took the place of the cupola normally found on a caboose. Here the brakeman or conductor could sit and watch over the train as it rolled along; during the

next few days I found myself spending many hours perched on these seats. Immediately ahead of them were two large bunks, each hung with mosquito netting. The conductor's desk stood at the foot of one of the bunks, and a dining table at the foot of the other. Neatly arranged on the top of the desk and in the cubby-holes above was an assortment of way-bills, reports, time-tables, slips, forms, and orders. I soon learned that the conductor was Carl Whiteman and the brakeman Bill Wintermute. Slowly, almost reluctantly, night fell and with it came more rain. It was after eleven by the time we reached Lac la Biche. Carl had suggested that I sleep in the coach rather than spend the night at the hotel in town. On Monday, I walked around the streets of Lac la Biche.

After enjoying a leisurely breakfast at the coffee shop in the York Hotel and looking around town, I wandered slowly back to the depot. Everything had been quiet when I left, but now there was a flurry of activity. On the platform passengers were milling about, almost all of them Indian or Metis people, and a second caboose-coach (No. 304) was added to handle the morning's crowd. Up in the baggage car Bill was taking on less-than-carload freight: a wringer washing machine that was going to Conklin (it weighed 100 lbs. and the shipping cost for the eighty-mile trip was $5.25), a television set, gabs of horse feed, a large, plastic swimming pool, and boxes of groceries for the sectionman at milepost 235. He was also loading packets of mail and magazines to be delivered along the way.

We were forty-five minutes behind schedule by the time we left Lac la Biche. It was overcast again and there was a threat of rain in the air as we wound around the shores of Big Bay heading toward Barnegat, the easternmost point of the lake. The noise of our train startled some birds that had been resting in the reeds and put them suddenly into flight. They circled for a moment, then landed further off. We did not stop at Barnegat, but turned north towards Tweedie, eight miles up the line. There we unloaded the swimming pool, delivered a bundle of mail, and picked up forty bales of hay to take to Chard.

At Philomena, milepost 151, the train ground to a halt and Carl and I walked up to the engines. I was introduced to Bob

Coffin, our engineer and the voice over the radio, who wished to know how the train was riding back at the tail end; it was a heavy load, he explained, and he had to work the two engines with care; he hoped it hadn't been too bumpy a ride. Up in the cab with him was Mitro Goriniuk, the second brakeman, a small cheerful man whom I had seen inspecting the train at Dunvegan Yards. After comparing notes with Carl, Bob ran the train slowly past while Carl checked for hotboxes—overheated journal bearings—and defective brakes. All was well, and we jumped aboard as No. 307 rumbled slowly by.

As the morning wore on some of the younger passengers came and stood shyly at the doorway of the partition that separated the coach from the caboose. They were hungry and wished to buy sandwiches and drinks. The menu was limited: luncheon meat or bologna sandwiches, 50 cents; root beer, cola, orange, or grape soda, 25 cents. Each sandwich was made to order, and as business got brisk, Bill enlisted my help. I hadn't counted heads, but guessed that there were twenty or twenty-five passengers aboard, and each seemed to be ravenous. The money we collected went into a kitty from which additional supplies were purchased. Any profits eventually were divided among the permanent members of the crew.

On board for this part of the trip were a young man and his fiancee. They were travelling to Conklin where they would begin to teach in September. They had both just graduated from university; Larry with a degree in physics and mathematics and Pat with one in physical education. They had never been in northern Alberta and were anxious to see the town they'd signed up for. They were excited about the coming year, especially Pat who eagerly told Bill of their plans. In addition to their salaries, which together totalled almost $17,000 they would be receiving over $1,000 as compensation for their virtual isolation. The couple they were replacing had decided to teach at an even more remote post, one that could be reached only by canoe or bush plane.

At Conklin, the largest of the settlements between Lac la Biche and Waterways, it took some time to unload all the packages and parcels from the baggage car. I asked Carl what the

people of the village did for a living. Many of the men, he told me, ran trap lines during the winter catching mink, beaver, muskrat, and lynx. A few of them worked on section gangs, or maintenance-of-way crews, for the railway. Aside from this there are few jobs.

By four-thirty we were in Anzac. It was raining, as it had been intermittently all afternoon. We had stopped only three times since Conklin: once at Chard to let off a student nurse who was taking her training in Edmonton and returning home for the holidays; once in the middle of nowhere to let off our last passenger, an elderly Indian laden with groceries; and once at milepost 235 to pick up three vacationing fishermen, one of whom passes around some freshly-smoked jackfish. The fish were tough—the result, Carl explained, of insufficient smoking.

A few miles on it was time to check again for hotboxes and bad brakes. Much of the twenty miles to Waterways was down a 2½ per cent grade and it was important that everything be working properly. Carl found all was well, and as he climbed aboard No. 307 asked me to give Bob the 'highball.' We moved at a crawl, the smell of brakeshoe smoke strong in the clean, still, air. As we wound our way down it was possible to see in some of the bank cuts, traces of bitumen-rich tar sand, the resource responsible for the change in the character of the Fort McMurray area during the past five years. Bill pointed out places where the tracks were to be re-routed, thus eliminating some of the sharper curves. Shortly after six o'clock we reached the Clearwater River which, because of all the recent rain was high and very muddy. Minutes later, three hundred miles and almost twenty-five hours after leaving Dunvegan Yards, we came to a stop in front of the Waterways depot.[5]

And finally, will the *Muskeg Flier* ever reach Fort McMurray? To reverse an old adage, if Mahomet will not go to the mountain,

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[5] Armstrong, James B. 1973. "By train to Fort McMurray." *The Beaver*, Outfit 304, No. 3, Winter: 22-29.

perforce the mountain must go to Mahomet. And this is just about what happened at the junction of the Clearwater and the Athabasca. In 1948 the two little towns united under the name of the older, or almost under that name. Since the denizens of Waterways could not see themselves becoming citizens of the rival Fort McMurray, the name of the latter was adopted without the first word.

McMurray was a town like no other. It was built on the plan of a dumbbell or rather on the specifications of one of those Inuit toys which consists of two weights connected by a long cord. The two settlements continued their existence, connected through three empty miles by a single road. Today, however, "The Prairie," which intervened between the two extremities of the town, is completely built up.

In 1962, when the new Peter Pond school was opened, a visiting educational administrator expressed regret that the fine old name of Fort McMurray had been allowed to disappear. The town council took his words to heart; soon the *Alberta Gazette* announced that the 'new town' had re-adopted the old name.

Note: Original Elizabeth Taylor papers are in the personal collection of her great nephew, James Taylor Dunn, research associate of the Minnesota Historical Society. Their author was the daughter of James W. Taylor, first American Consul appointed to Winnipeg.

Chapter Seven

Wayfaring, Airborne and Earthbound

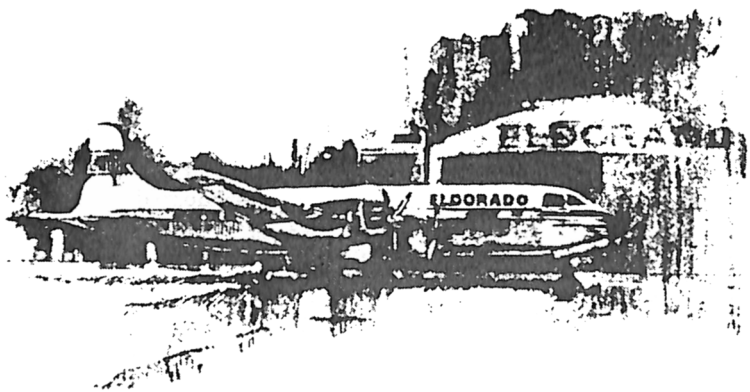
John W. Chalmers

Wings Over the Waters

Until the 1920s, Canada's Northland was still that of Jack London and Robert Service, inscrutable and implacable, unknown and unforgiving. Except for a few scattered settlements, as distant, seemingly from one another, as the stars in the firmament, it was as it had been for centuries, as it had been from the beginning of time, or at least the European's time on this new continent. But in the Twenties the aircraft introduced a new element into the North, shrinking travel time, by canoe or snowshoe and dog-train, from weeks to hours. Soon war-trained aviators were flying all kinds of people 'down north'—missionaries, prospectors, fur traders, police, government functionaries, almost anyone who had business among the high latitudes.

Fort McMurray–Waterways, at the end of the steel and the foot of the rapids, had been one of the few gateways to the Arctic. But airplanes, operating interchangeably on wheels or skis or pontoons, could start anywhere and go anywhere; consequently, the Fort at the Forks did not become the transportation hub for airborne business that it had been for earthbound traffic. Still, through the decade it saw its share of the wonderful new flying machines, usually float-equipped in summer, fitted with skis in winter, landing on the Snye, that reversible channel lining the Athabasca and Clearwater.

For the twin settlements, with respect to aviation, 1929 was their *annus mirabilis*. The year began in January, when C.H. ("Punch") Dickins landed a Western Canada Airways Fokker at Waterways, to begin a schedule of ten winter trips to Fort Simpson. Dickins had flown over the District of Mackenzie the year before, but from Winnipeg and through northern Saskatchewan. Because of the early freeze-up in 1928 and subsequent bad weather, considerable mail had accumulated at the end of steel awaiting movement by dog-train. When it was suggested that Dickins could carry the mail, he jumped at the chance to make an honest dollar for his company. Thus at almost a moment's notice the first airmail left Fort McMurray without fanfare on January 23. In March, he penetrated the North as far as Fort Good Hope. On the day he began his return, the temperature dropped to -54°. He brought out a valuable load of baled furs on this trip, the first time such a cargo had come out of the North by air. On July 1, Dickins touched down at Aklavik, becoming the first flyer to reach the Western Arctic coast.



Airborne from Edmonton.

A short time later, Western Canada's manager, Leigh Brintnell, set out on what was to be the most ambitious flight in the North to that time. Leaving Winnipeg on August 5 in a Fokker seaplane, he

flew to The Pas, Manitoba, then to Edmonton, where he received instructions to proceed to Fort McMurray. There he picked up two passengers and headed north, to make a complete circuit of Great Bear Lake. His two passengers were G.A. Labine and a Dr. Bannerman. Labine staked uranium claims on Great Bear which were developed into the Eldorado mine. Radium from this mine broke the Belgian Congo's strangle-hold on this metal, driving the price down from $70,000 to $35,000 per gram. Eldorado uranium fuelled the atomic bombs that brought Japan to its knees and ended World War II.

Brintnell continued his air odyssey to Aklavik, crossed the Rockies to Dawson and Whitehorse, and continued down the West Coast of Juneau and Prince Rupert. From there, by way of Edmonton, he returned to Winnipeg, completing a 9,000 mile circuit, of which over one thousand miles had been flown beyond the Arctic Circle.

The Land of Peter Pond was definitely on the aviation map. In contrast to Dickins' almost absentminded mail run in January, by the end of the year a regular air mail contract had been granted to Edmonton's Commercial Airways, managed by its chief pilot, an outstanding war-time and peace-time flyer, W.R. ("Wop") May. Whereas Dickins' run was unheralded and unannounced, May's first mail flight was well advertised, with the result that philatelists sent over four tons of letters, 120,000 of them, to earn the first flight cancellations and cachets or imprints.

On this flight, as on many other early northern runs, the Canadian post office neither issued special air mail stamps nor established special rates. Instead, it authorized the carriers to print their own special stickers, usually for 25¢, which were supposed to be affixed to the back of the letters, although sometimes they appeared on the front. These semi-official but essentially private stickers were the first air mail stamps issued in Canada and a unique phenomenon in the philatelic world.

This 'first flight' turned out to be not single but multiple. Three aircraft were used to move the mail from Edmonton to Fort McMurray, and two from there on, piloted by May and Glyn Roberts. The northern air lift began from Fort McMurray on December 10, 1929 and took seventeen days of shuttle flights to complete the project, carrying mail to thirteen points as far down the Mackenzie as Aklavik. During the operations, temperatures down to -60° were encountered. Then, since most of the mail was intended for stamp collections, it all had to be flown out again.

Since Commercial Airways had a four-year contract, its headquarters were transferred to Fort McMurray. May moved his residence there, to remain for six years, the most famous flyer ever to call that center his home. During this period, his company merged with Western Canada Airways, but May continued as western superintendent.

It was as well that Commercial had its mail contract. With the advent of the Great Depression, the bewildering array of little flying concerns which the prosperous Twenties had spawned were in serious trouble. Many ceased operation; others survived only by merging with other companies. The united Commercial and Western Canada Airways soon became part of Canadian Airways, Ltd., destined for a great future. During World War II, it was the largest of some ten corporations which were merged to form Canadian Pacific Airlines (now CP Air), which provided scheduled air service to and through Fort McMurray into 1959, when its operations in the Western Arctic were taken over by Pacific Western Airlines.

Although bush flying slowed during the Thirties, it did not cease, and in fact the decade saw more notable advances in the art. It was in this period that Canadian designers developed the Norseman, the first true bush aircraft, which was followed after World War II by the Beaver and the Otter. These craft were specially designed for northern flying. High-wind monoplanes rather than the increasingly popular low-wing configurations, they were both easier to load and provided better visibility of the ground beneath, a

characteristic particularly essential in search-and-rescue operations. The large wings of these aircraft provided great lift, which increased carrying capacity, of major importance in the movement of freight. They also permitted low take-off and landing speeds. The short runs which these allowed permitted operation from confined areas, usually small lakes or rivers. Of course, the large wings also meant a high drag factor and low cruising velocity, but even a speed of a hundred miles an hour was incomparably better than the twenty or thirty miles a day—and over a winding course—that surface-bound transportation by canoe or dog-sled provided. The fuselages of these bush planes were also designed primarily for freight operations. For example, the main door had to be wide enough to accommodate a 45-gallon oil drum. A supplementary door led to the cockpit, to permit the pilot to reach his 'front office' when the cabin was filled with freight to the very ceiling.

World War II, particularly the United States' participation, greatly increased air activity in the Land of Peter Pond. It was at this time that Fort McMurray got the airport, complete with paved runways that subsequently permitted the center to be served by major airline schedules. The airport was distant from the town by twelve miles of road, reputed to have some ninety curves in its length. Subsequently many of these were eliminated.

In 1945, the West Coast saw the formation of a small new air transport company that was eventually to become the third largest scheduled air line in Canada and to have a vitally important role in the development of the Land of Peter Pond. This was Pacific Western Airlines, which in 1956 purchased Associated Airways, a charter company operating single and multi-engined aircraft on wheels, skis, or floats, depending on the terrain and the season. During the Fifties, much of PWA's business was connected with national defence, specifically the construction of the Mid-Canada and DEW-line radar establishments. One of the former, incidentally, was located near Anzac, just a few miles south of Fort McMurray. In 1959, PWA took over CP Air's Arctic operations, becoming a

scheduled freight and passenger carrier. In 1965 it sold its 'bush' operations to Northward Aviation. In 1974 PWA was purchased by the Alberta Government.

Please Wait Awhile, as it is sometimes affectionately and/or derisively known from its initials and its orientation to freight rather than passengers, moved into scheduled operation in Northern Alberta just in time to participate in the long-awaited development of the area's tar sands. The 250-million dollar project of the Great Canadian Oil Sands began at Mildred Lake, thirty miles north of Fort McMurray, early in the 1960s. Naturally, a scheme of this magnitude developed a tremendous volume of traffic, both freight and passenger, for PWA. Indeed, for a while the company scheduled flights right to Mildred Lake, until the light runways proved inadequate for the increasingly heavy aircraft, while completion of a good paved road and bridge across the Athabasca provided ready access to the Fort McMurray airport.

Another aviation company which is important in northern flying is Eldorado Aviation Ltd.. This is a wholly-owned subsidiary of Eldorado Nuclear, Ltd., a crown corporation formerly called Eldorado Mining & Refining Ltd. This company was established in 1944, with the formation of the Manhattan Project, when the Canadian government took over Eldorado Gold Mines Ltd., to operate the uranium mines at Port Radium, N.W.T. and Beaverlodge (Uranium City), Saskatchewan. Gilbert Labine, discoverer of uranium, was president of the parent company.

As always in such remote operations, among the most vexatious problems are those of logistics. At first, Eldorado, the parent company, turned to common carriers for air transport of freight and passengers, but soon found such service, especially in the war-time emergency, slow and unsatisfactory. In the spring of 1944 its warehouses in Fort McMurray, Fort Smith, and Yellowknife were filled with freight destined for Port Radium. Consequently the company set up its own Aviation Division, which was established as a separate company on 1 January 1953. From May 1944 to December

1945, its two Norseman aircraft moved 1,061 passengers and 227,487 pounds of freight over 289,766 miles.

Eldorado Aviation's freight was not always made up of perishables or urgently-needed machine repairs or similar high-value, low-bulk material. During the 1950s aircraft were used to move lumber from a sawmill on the Lower Peace to Port Radium and Beaverlodge; a DC-3 being employed for this purpose. As the sawmill was located inside Wood Buffalo National Park, before landing, the aircraft usually had to 'buzz' the runway to clear it of buffalo feeding on the strip.

Other cargo items have included underground tram-cars, mucking machines weighing up to 7,500 pounds, fly-wheels (9,000 pounds), and twenty-foot tanks (14,000 pounds). Usually Eldorado's own equipment had been able to handle the jobs, but in 1952 the company had to charter a front-end-load Bristol Freighter to move some steel rafters too long for its own aircraft. In 1956, early freeze-up forced Northern Transportation to leave a number of bulky transformers (9,000-14,000 pounds) at Fort McMurray. Eldorado was able to borrow an R.A.F. Blackburn Universal, undergoing cold-weather tests at Namao, to move the transformers north.

With the closing of the Port Radium mine and the replacement of Norsemen by multi-engined aircraft, Eldorado's planes are still seen in the skies over the Land of Peter Pond, but seldom on the ground. However, both Fort Chipewyan and Fort McMurray are designated alternate landing sites for emergency use.

In 1973, the company's flying equipment included DC-3s and DC-4s, as well as Sikorsky and Bell helicopters. Its role is to supply air support services for Eldorado Nuclear, Ltd., and associated crown companies, specifically Northern Transportation and the recently acquired Grimshaw Trucking.

PWA and Eldorado are not the only aviation companies that did or do operate in Siberia's tar sand area. Frequently, charter service in small aircraft is needed by sportsmen, civil servants, prospectors, and others, and such services are available from Fort McMurray. An early

entrant in this field was McMurray Air Services, absorbed about 1970 by Gateway Aviation in Edmonton, and there are others.

Whereas for many years Fort McMurray was scarcely more than a way-station on the route to the high North, today it is a terminus in its own right. Of PWAs, fifteen flights (each day) between Edmonton and the tar sand area, twelve originate or end at Fort McMurray. The remaining three serve Fort Chipewyan, at the northern end of the Land of Peter Pond, and Uranium City in Northern Saskatchewan. The pending and prospective Syncrude and Shell developments in the tar sands will be well served, aviationally speaking.

The Road to the Rivers

In the development of Western Canada, the appearance of transportation facilities usually followed the same sequence. The rivers formed the first highways, followed by trails or roads, then the railways, finally the airways and pipelines. For access to the Land of Peter Pond, however, the Highway, No. 63, was the last to be developed. Until the beginning of the Sixties, the Northern Alberta Railways proved quite adequate as a freight carrier for the twin villages of Waterways and Fort McMurray, supplemented by air transport for most passengers and high-priority freight and express shipments.

With development of the oil sands near Fort McMurray, the building of adequate highway access assumed a high priority. The provincial Department of Highways took first steps in this direction during 1962 and 1963 in choosing a route, based on air and ground surveys. Final selection followed neither the upper Athabasca River with its many rapids nor, as in most parts of the province, the existing railway. The choice, as far as possible, was the high ground between these two landmarks. Sound as this decision was, it meant that construction could proceed only from each end of the route and inch towards the middle. It was impossible to build intervening

sections simultaneously, for there was no way to get equipment and supplies to such places until they could travel over the new construction.

The new highway was not quite the first road link between Fort McMurray and the rest of the world. Mention has already been made of Moberly's feat in moving horses and oxen from Lac la Biche to the Clearwater in the 1870s, a feat which in retrospect seems virtually impossible. A low-grade forestry road did connect Fort McMurray to the rest of the world, but as it was functional only when frozen in winter and lay far from the route of the new highway, it was of no use in the new construction.

As mentioned, as far as possible, the road to the Fort followed high ground, but unavoidably, some 35 of the 156 miles in total were through muskeg in stretches of three to six miles and up to thirty feet deep. Highway 63 began at Highway 46, a few miles west of Lac la Biche. For the first 31 miles, to Wandering River, it followed a low-standard district road through a farming community on the edge of settlement. For this stretch, construction presented no problems. But after that, the wilderness!

In the spring of 1963, the Provincial Government let a contract for the section between Miles 31 and 53. Because of the difficulties in the muskeg section and the fact that work could proceed only from the south end, it was late in the summer of 1964 before the contract could be completed. Even then, many of the fill sections were poorly built. During the winter of 1963-64, two clearing contracts were let for the remainder of the route; Miles 106 to 156 at the north end and Miles 53 to 106 in the center. In the spring of 1964, construction began on two sections, Miles 53 to 78 and Miles 133 to 153, after preliminary survey and soils information had been obtained.

At the end of the normal construction season, work on the northern contract had been completed, except for four miles of muskeg, but the other section was far behind schedule. This was largely because of what one engineer called "the usual obnoxious

weather," which made it impossible to move heavy equipment through or over the muskeg, soft and spongy under the best of conditions. The Department of Highways therefore permitted work to continue during the winter, when the frozen ground surface could carry the massive earth-moving machinery. Progress continued, therefore, despite temperatures which dropped to -40 and -55°F. In January 1965 another contact for Miles 106 to 133 was signed, activity to begin during the following winter. During 1965, a careful assessment was made of the construction completed during the previous winter; it was found to meet a higher standard than that during the summer months.

R.H. Cronkhite summarizes the advantages of winter construction as follows:

> ...where freezing provided the necessary ground support for improved embankment construction, operations were accelerated, quality was improved, and costs were lower than for similar sections constructed during adverse summer conditions.[1]

Elsewhere, Cronkhite was more specific as to the advantages of winter construction:

> Drainage was accelerated through the advance drainage system. The settlements which occurred were uniform and gradual, having advanced slowly during the winter through the partially frozen fibrous material. Ready access was available to borrow pits for completing the grades. Equipment could be organized and advanced ahead to complete work between the muskeg areas

[1] Cronkhite, R.H. 1968. "Winter construction experience in Alberta." *Canadian Good Roads Association*, p. 211

> where normal cut-fill could not previously be reached nor equipment serviced.[2]

But these advantages were gained only at considerable cost, as G.G. Stotts explains:

> Cold weather results in larger equipment expense bills for a variety of reasons. The continuous round-the-clock operation of motors increases fuel costs. The use of ripper tractors, a necessity for winter grading, increases expenses for operation and maintenance. Scrapers have their problems with hydraulic lines, rubber hoses become brittle, metal parts breaking due to brittle fracture and the vulnerability of tires which in these conditions can be cut by frozen lumps of material or punctured by frozen sticks. Wet material, freezing to the scraper bowl, necessitates frequent removal by jack hammers. Repairs and replacement of parts are slow because of the necessity of improvising temporary shelter or towing units to the repair shop. There is also an obvious drop in the efficiency of mechanics when they are working in conditions that expose them to the elements. In addition, there is a strong probability that some damage to structural parts will occur and, though not apparent at the time, result in breakdown during the subsequent summer session.
>
> Additional maintenance staff is required because of steadier operation with more prolonged periods of work and the resulting probability of more frequent breakdowns. An enclosure or shelter containing heating units suitable for performing maintenance work is essential. Additional foremen and supervisors are necessary to ensure the proper completion of each stage as work progresses. Finally, a winterized camp adapted

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[2] Cronkhite, R.H., 1966. "Highway construction through Muskeg Areas in Northern Alberta." unpublished report of *Twelfth Muskeg Research Conference*, p. 6

> for extreme cold weather living is required. Heating and control units must be dependable and are consequently costly.[3]

On the other hand, winter work avoids the pestilential swarms of mosquitoes, reputed to be among the biggest and fiercest in the Canadian North. But a report that flight attendants once pumped forty gallons of aviation fuel into one that landed at the Fort McMurray airport before they noticed it wasn't an aircraft is probably apocryphal.

After freeze-up, 1965, Highway 63 accommodated through traffic on a continuous basis, except for the spring ban common on many Alberta roads. The final section of the highway, Miles 78 to 106, was completed during the 1965-66 winter.

The Highways Department has found it wise to allow at least one, preferably two, years between completion of road-building and paving in order to permit full settlement of the roadbed. As a matter of fact, final paving was not scheduled for completion before the end of 1974.

The completed highway occupies a right-of-way 200 feet in width, three times the 66-foot road allowances provided for in the land surveys of the province. The greater width is necessary to provide parallel drainage ditches and berms needed to assure road-bed stability through muskeg areas. In forested areas, clearing the right-of-way allows sunlight on the roadway, making for a more ice-free surface and permitting faster during following spring thaws.

The road-bed itself has a paved width of 34 feet from Highway 46 to Wandering River, 24 feet from there on. Normal grades are 2% or less, the maximum being 7%. On horizontal curves, the line-of-sight is half mile ahead or more; on vertical curves it is 750 feet as a

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[3] Stotts, G.G. 1968. "Winter grading techniques." *Canadian Good Roads Association*, pp. 215-216.

minimum. Highway signs and other developments are under strict government control.

As well as a number of culvert structures, four bridges were needed over the la Biche, Wandering, Hangingstone, and Athabasca Rivers, the last at the Fort McMurray end of the road. None of these presented any unusual structural problems. An extension of the highway leads to Mildred Lake, site of the Great Canadian Oil Sands operation.

Today, except for a little local traffic between settlements far off Highway 63, the *Muskeg Flier* is deserted. Earthbound passengers between Edmonton and Fort McMurray prefer the swift, comfortable Coachways buses. Similarly, for small, urgent, or perishable shipments Pacific Western Trucking (a subsidiary of PWA) provides formidable competition to Northern Alberta Railways.

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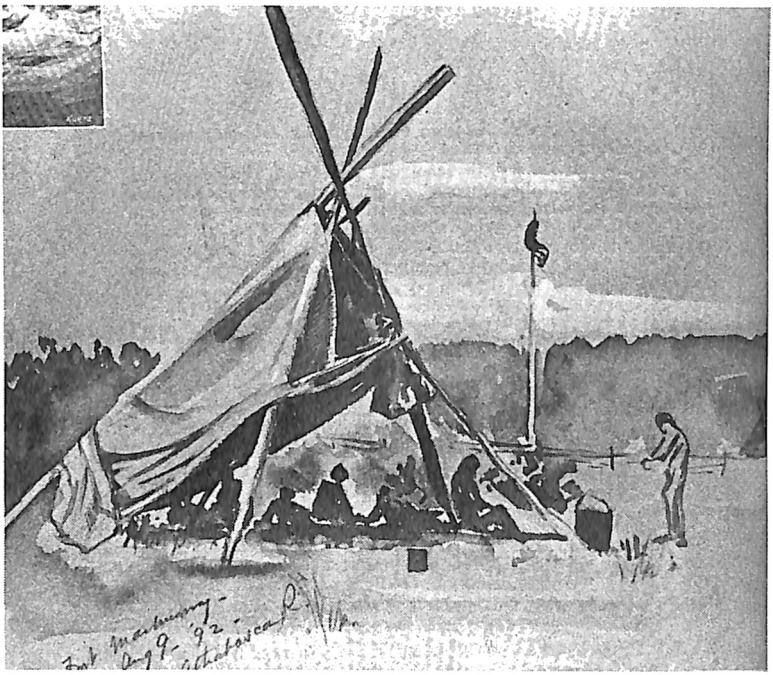


Camping at Fort McMurray. 1892 (Elizabeth Taylor).
Minn. Historical Society.

Chapter Eight

Boom and Bust, Bust and Boom

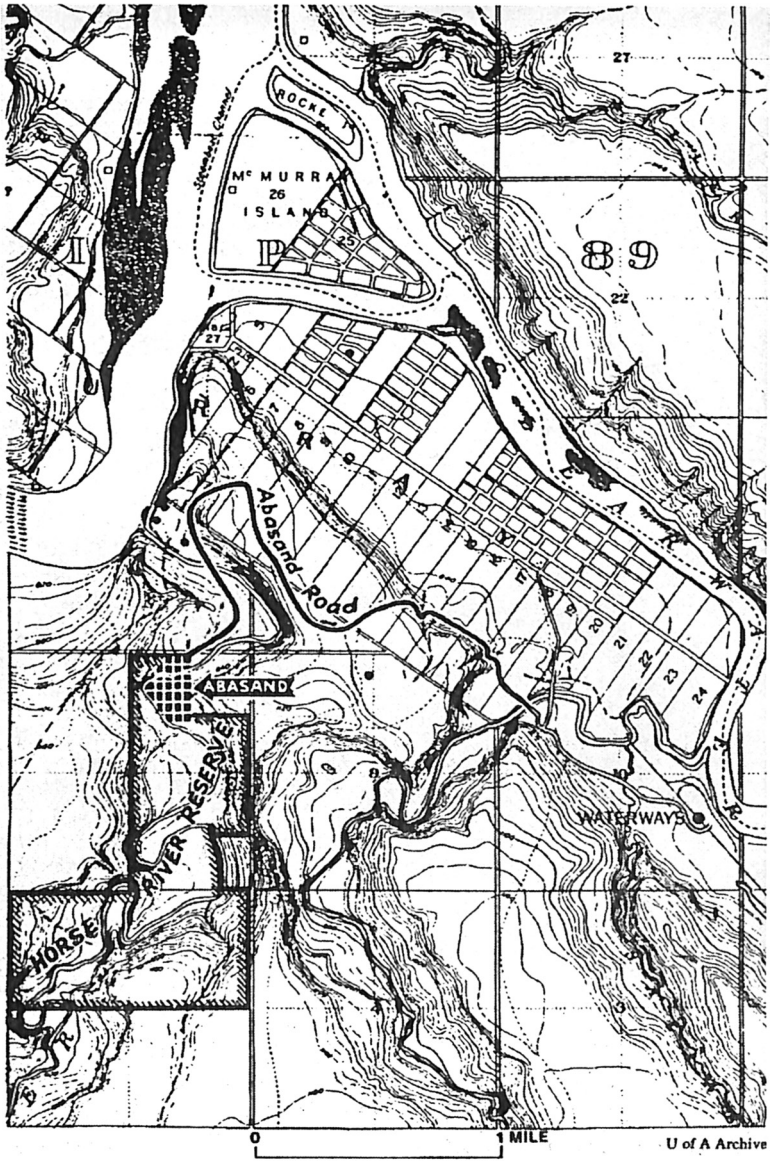
Fort McMurray and Waterways

Edgar D. Cooke

As noted in an earlier chapter, no fewer than four fur trade posts were established at the junction of the Clearwater and Athabasca between 1786 and 1804. However, none of these proved to be viable. Some time after 1821, as a result of a small-pox epidemic, the Fort of the Forks was abandoned. Thereafter, the mouth of the Clearwater was deserted, except for transient traders and explorers, until Henry Moberly built Fort McMurray in 1870. From that date, for almost a century, few centres have ridden such a roller-coaster of anticipation and disappointment as has that little fur fort. It has always been a settlement of Great Expectations.

Its almost total destruction by fire in 1871, and the near catastrophe by floods and rampaging blocks of drifting ice in 1875, somehow set the pattern for the mercurial style of Fort McMurray's future existence, anticipation and activity alternated with anti-climax and stagnation but, like some hardy northern shrub, never quite drying out.

For the next forty years Fort McMurray grew very slowly, if at all, in spite of periodic mineral surveys of encouraging report. S.C. Ells, who was undertaking the first comprehensive survey of the tar sands for the Mines Branch in 1913, described Fort McMurray as:



Fort McMurray, Waterways, and Abasand Sites, late 1930s.

> ...consisting of a dozen primitive log cabins, a bug-infested hovel proudly referred to as a 'hotel' and during the summer months, many Indian tepees and tents. Everywhere starving train dogs roamed at will and the greatest care for the protection of food and other supplies was essential. The Community depended solely upon the fur-trade and this was conducted by the Hudson's Bay Company and two 'free-traders' in small log cabins. There was no telegraphic communication but theoretically a small mail service operated from Athabasca four times a year, by water in summer and by dog-train in winter. Damage to, and loss of goods, in transit dictated commodity prices and salt, sugar and similar perishable goods sold at three pounds for a dollar. Consequently McMurray was known as one of the 'three for a dollar settlements.[1]

Expectations prompted by the investigations of S.C. Ells started the first real boom in Fort McMurray and a few homesteaders suddenly found themselves rich. One, having received $40,00 for his property, walked out to the nearest railhead and tried to charter a train to take him to Sunny California. Others, whose generosity exceeded their wisdom, invested their windfall with the assistance of many willing helpers, in 'assets' of a more liquid though transitory character.

When the news came that the tar sands were not as yet an economical proposition, the boom ended and lots that were formerly being purchased at $1,500 were soon being offered at $8.00. The more stable, if less exciting industries of furs, lumber, and fishing, again became the order of the day.

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[1] Ells, S.C. 1962. "Recollections of the development of the Athabasca Oil Sands." *Information Circular 139 (July).* Ottawa: Mines Branch, Department of Mines and Technical Surveys.

Every town in the West in the 19th and early 20th century had as its vision "the day when the railway will reach us." For then the town would be on the map and in touch with the rest of the world, and everyone would prosper. Fort McMurray was of course no exception, and in fact desperately needed a railway, since the journey by wagon road from Edmonton to Athabasca Landing and thence by barge to Fort McMurray must have been an excruciating ordeal as well as totally unreliable.

In this period, railway building was being promoted everywhere, rather like shopping centres today. Many of the companies had names longer than the track laid; the creative imagination of the promoters far outstripping the financial and technological realities. When the Alberta and Great Waterways Railway was formed in 1909, under circumstances that can most politely be described as free-wheeling, Lac la Biche was being hailed as a second Lake Louise and Fort McMurray would soon become an important junction linking railways and steamships to Arctic points.

By 1916, the railway had reached Lac la Biche, and Fort McMurray looked forward with patient expectation for 6 years as the line crept its way north. But Fort McMurray was doomed to disappointment, for in 1922, the railway company terminated the line about 8 miles from the townsite, claiming that this location was more suitable for train to boat transfer. Later in 1928, the line was extended to the mouth of the Hangingstone River at the site of present-day Waterways. The broad flood plain of boulder and gravel prevented the extension to Fort McMurray and a large fish warehouse was constructed to handle the 2,500,000 lbs. of fish per year being harvested from Lake Athabasca. Thus, the railway never did reach Fort McMurray, nevertheless Fort McMurray was soon unabashedly calling itself the 'Port of the North and the Doorway to the Arctic Where Steel Meets Keel.'

Fishing Industry

The completion of the railway to Waterways made feasible an extensive and stable industry in the Land Of Peter Pond, McInnes Fish Company being the pioneers in this field. In 1926 they moved six boats from Lesser Slave Lake, running the Athabasca Rapids and digging their vessels off sand-bars, to start commercial fishing on Lake Athabasca. They also built an icehouse at Waterways to store ice for use on the boats and to pack the fish for shipment to other parts of this country and to the middle United States.

At first, HBC barges were used to transport the fish from Lake Athabasca to Waterways, but later the company built their own little fleet. The *Norbaska* was used on the river stretch; the *Noralta* and *Norlac* collected the fish from the various camps on the lake. After ward, fifteen to twenty small fishing craft, each manned by two or three men, operated on the Athabasca from the middle of June to the middle of September. Soon other companies entered the field. In 1928 the National Fish Company built another icehouse at Waterways, and some additional barges. In 1934, McInnes modernized the industry by using special freezer barges, equipped so that the freezing and packing operation could be carried out on the lake itself. Soon, about a million pounds of fillets of wall-eye, whitefish, and pike, as well as whole whitefish and lake trout, were being shipped out each year in the refrigerated cars of the NAR. The commercial fishing prompted the development of a small but vigorous and significant ship and barge repairing and assembling industry, which serviced the whole river system to the Arctic. Directly associated with it was a wooden box factory employing about fifteen to twenty persons.

Recently, the Freshwater Marketing Corporation has taken over McInnes' processing operation, with the Saskatchewan Fish Co-op buying out the Company's holdings on Lake Athabasca.

Salt Industry[2,3]

Between 1907 and 1912 the Northern Alberta Exploration Company drilled two exploratory wells at the mouth of the Horse River to a depth of 1,046 feet, which yielded the information that underneath lay thick beds of salt. In 1912 Athabasca Oils Ltd., drilled a hole twenty miles east of Fort McKay discovering more salt and, interestingly enough, some gold between granite layers, worth about $13.00 per ton of ore handled.

With the arrival of the railway, interest in the salt deposits renewed and in 1929 the Alberta Salt Company spent about $84,000 constructing a salt plant at the mouth of Horse Creek. Even though the salt was said to be very pure, the company was not a financial success, since the salt had to be manhandled over a high plateau to reach the railway and the transportation costs were too much of a negative factor. However, it did operate intermittently during the period 1925-1927, producing about 2,970 tons of salt before shutting down.

In 1928 the Alberta Department of Railways drilled another exploratory hole near Waterways and encountered a thick bed of salt. Nothing further was done to develop this, as at that time the Alberta Government was trying to get out of the railway business.

Eight years later Industrial Minerals Ltd. was formed with F.I. Batcheller as president and C.H.F. Cottee as mining engineer. This company drilled a hole near Fort McMurray townsite and sent the core to Dr. J.A. Allan, Professor of Geology at the University of Alberta, who noted in the core log "...493 ft. - 694 ft. ... rock salt..."

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[2] 1929 and 1937. *Transactions of the Canadian Institute of Mining and Metallurgy,* Vol. 32: 232-254 and Vol. 40: 614-628.

[3] Hamilton, W.N. 1971. "Salt in east-central Alberta." *Bulletin No. 29.* Edmonton: Research Council of Alberta

He estimated that deposit at approximately 500,000 tons of rock salt per acre, which meant that Fort McMurray was sitting on 30 million tons of available salt. Based on this information Industrial Minerals built a salt plant in 1937. The salt was recovered by pumping hot water down a well and pumping the resulting brine out into shallow evaporating ponds.

This plant operated until 1950, when, after the discovery of large salt beds in the Elk Point region about 100 miles east of Edmonton, a new salt plant was built at Duvernay and the Fort McMurray operation was terminated. So ended Fort McMurray's expectation of becoming the Salt Capital of North America.

Other Developments

During World War II, Fort McMurray became an important base for the CANOL pipeline project, which was initiated to supply military airfields in Alaska with oil from Norman Wells. Thousands of tons of steel pipe and equipment for the line were shipped by rail to Waterways and transferred to river barges.

After the war, Fort McMurray again declined in importance in spite of some increase in river traffic prompted by the Cold War demand for uranium. Although a number of oil companies were, by the late 1950s, engaged in exploration and experimentation in the tar sands area, they tended to isolate themselves in independent camps and their impact upon Fort McMurray was only marginal. The completion of the railway and highway to Hay River further decreased Fort McMurray's importance as a base for the North and it waited resignedly for the much talked about 'some day' exploitation of the tar sands.

Perhaps the most interesting story of Fort McMurray lies not so much in statistics of population growth or tonnages shipped, but in the lives of the many interesting and remarkable people who inhabited the town. It was never a government nor a company town, it was always a self-sustaining unit. This relieved it from those

divisive forces that are only too often present in northern towns, where there are deep social and cultural barriers between government or company personnel and the rest.

The inhabitants of Fort McMurray had come from all parts of the world; many had literally walked in from Edmonton, attracted by stories of the latest boom, and had stayed because they liked the frontier atmosphere with its hopes for the future instead of regrets for the past. Fish and game were plentiful, the soil and the long hours of sunshine supported an abundance of garden produce, so it was possible to exist on a very modest income, free from the stresses, pretensions, and false values of more settled areas. Considering themselves as part of a vast territory equal to the distance between Edmonton and New York, the inhabitants of Fort McMurray were, as noted by several travellers and journalists, refreshingly free from the tiresome parochialism that afflicts so many small towns and indeed quite a few large towns big enough to know better.

Today and the Future[4]

Fort McMurray is situated on the edge of a 30,000 square mile tar sand deposit (about the size of New Brunswick), which contains about 300 billion barrels of extractable oil, 25.5 billions of which is extractable by surface mining. When it is considered that the U.S.A. has reserves of 34.7 billion barrels of conventional crude (including Alaska's 11 billion), Canada has 9.5 billion, Asia-Pacific 15.6 billion and the Middle East 350 billion, the importance of this deposit in terms of North American energy and Canadian economy is obvious. It is in fact rather surprising that in view of reasonably accurate predictions of future energy requirements

that more positive government action had not been taken to promote production from the sands some years ago.

In 1963 Fort McMurray had a population of about 1,200. In 1964 the Great Canadian Oil Sands Project was given permission to proceed. One of the conditions imposed by the Alberta Government being that GCOS could not build a company town at its plant site 17 miles north of Fort McMurray; it was to construct housing for its personnel in the townsite of Fort McMurray. This meant that the town, within four years, could expect to expand to a population of 5,000. To assist the town to cope with this situation, it was granted New Town status, which basically meant it was allowed to borrow capital funds in advance of having the normal population requirements. It also permitted the town to have direct help from provincial government municipal experts. The town was to be governed by a Board of Administrators, which at first consisted of two government officials and one appointed town member. At

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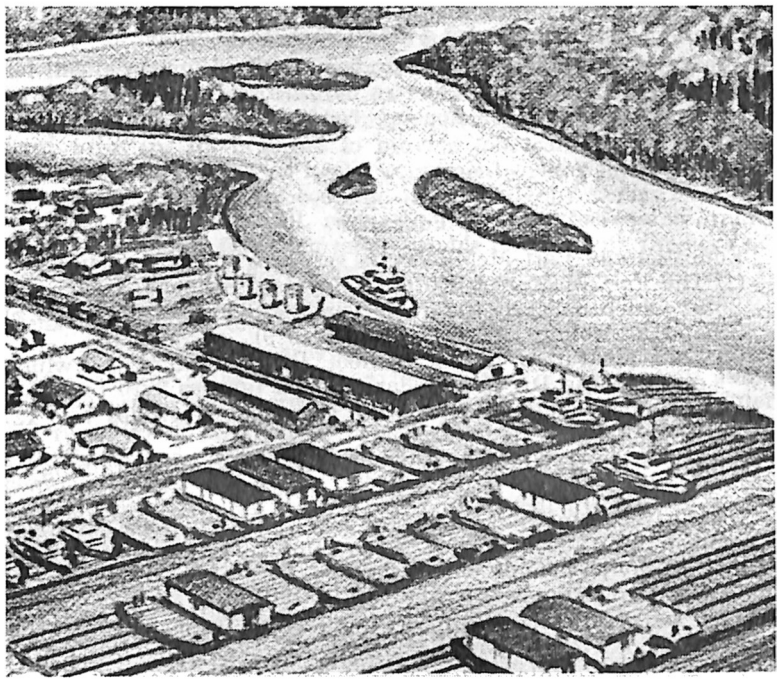
[4] Reid, Crowther & Partners, Ltd. 1973. *Report on the Impact of a Proposed Synthetic Crude Oil Project of Fort McMurray for Syncrude Canada., Ltd.* Edmonton.

present, the Board of Administrators has expanded to six members, all locally elected.

Today the population is rapidly nearing the 10,000 mark, and it is now with some justifiable trepidation that the inhabitants of Fort McMurray look to a further influx of people due to the



Steel meets keel at Waterways.

commencement of construction of the Syncrude project. Accommodation is the greatest and most immediate problem; trailer parks are overcrowded; apartments are fully rented before the foundations are started, and the costs rapidly absorb the higher-than-average wages paid in this area. In order to hold the wild escalation of land prices by speculators, the Alberta Housing Corporation

stepped in, somewhat tardily, as developer. Finding that there was no land left unowned in the townsite, they have started developing areas outside the town. Unfortunately, Fort McMurray, lying in a comparatively narrow valley, parts of which are susceptible to flooding, does not lend itself to easy expansion. Residential areas are having to be built on plateaus above the various small ravine-like valleys carved by rivers and creeks joining the Athabasca. Although these areas look attractive enough from an architectural and residential point-of-view, they are extremely expensive to develop. The Alberta Housing Corporation, taken to task for selling lots at $7,500 for which it had paid $300, rebutted with claims that these lots actually cost $12,000 each to develop.

Present calculations (constantly being revised upwards) call for the building of 3,375 more houses by 1979, a formidable task in view of the pressure for housing construction across the whole country.

Education

Educationally, Fort McMurray is served with three bodies:

(1) The Fort McMurray Catholic Separate School Division No. 32 which operates the J.A. Turcotte School (grades 1 to 5) and St. John's School (grades 6 to 9)
(2) Fort McMurray Public School District No. 2033 which operates the Dr. K.A. Clark School (grades 1 to 6) and a combined public and separate high school (grades 7 to 12) at the Peter Pond School.
(3) The Alberta Vocational Centre for job-oriented training of all age groups.

During the somewhat depressed period of the 1950s, between the end of the Cold War and the beginning of the tar sand era, the McMurray public school figure dropped from 186 to 79, whereas the Catholic figure rose from 48 to 217, reflecting a movement of white

(Protestant) families from the area and for some reason an increase in native and Metis populations.

In 1961 the Northland School Division, observing the generally low state of buildings, morale, and quality of education existing in the system, offered to absorb the public school district and to give the district a new school. The offer was eagerly accepted and the new school, the Peter Pond, opened in September 1961.

In 1970 the Fort McMurray Public School District was withdrawn from the Northland School Division (a system primarily for native children) as it was considered large and capable enough of operating independently.

At the end of 1972 there were 2,386 pupils at all the schools, a figure of 310 pupils more than stated capacities. This figure actually understates the situation as some of the stated capacities includes remodelled ancillary rooms, such as staff rooms pressed into service. There are now 85 classrooms in use, and by 1979 with the Syncrude development only considered, there will be a need for 218 classrooms. There is therefore an urgent need for at least two more high schools, a situation aggravated by the escalation of the price of a proposed school site from $180,000 to $625,000 in a matter of months in 1973 by an outside land speculation company (Allarco Developments). Another site suitable for a high school is on McMurray Island but this conflicts with a designated recreational area.

The situation regarding the Alberta Vocational Centre is a little happier for it is at least coping with its short-term needs.

This centre was founded during the construction stage of the GCOS plant to assist native and rural peoples to adapt to, and benefit from, the impact of industry upon their area. It has mainly tried to orient its program to provide job training for the local market. Such courses as heavy equipment operation, construction pipe trades, commercial cooking area were offered and widely accepted. Students came from all over the north; unfortunately many having graduated find themselves unable to cope with the high

accommodation costs associated with Fort McMurray and tend to drift back to their home communities where their newly acquired skills are not put to full use.

In the recreational area, the story is fairly satisfactory; there are over sixty clubs and organizations in Fort McMurray and a wide assortment of recreational facilities. Fort McMurray's internal recreational land supply of 5.07 acres per 100 population comfortably exceeds the figure of 2.90 average per 100 in towns of comparable size in Alberta. A healthy aspect of the recreation picture is that it is, far more than the national average, of a participatory nature.

Further tar sands developments in addition to Syncrude include Shell, Petrofina, and Can-Amera, who have applications in line to construct more extraction plants. Some of the developments will be located up to 45 miles away from Fort McMurray and presumably more townsites will have to be built downriver. Fort Mckay is one place being considered. Even with this spreading out of the impact, it is expected that Fort McMurray will have grown to a population of 15,000 by 1979 and to 30,000 by 1986, and both figures are likely to be understatements.

Such a quantum growth rate as this will present almost devastating problems to the town's administrators. The per capita debt of Fort McMurray is already $700 compared to the Alberta average of $100. Too much, too quickly and a little too late might become the by-word of Fort McMurray, and ironically its biggest boom might turn out to be its biggest bust.

Acknowledgements

Syncrude Canada Ltd.
Alberta Legislative Library
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Chapter Nine

The Long Technological Search

James M. Parker

Karl Clark leaned over the rail of the *Northland Echo* as it sluggishly churned down the Athabasca River from Fort McMurray. As he and his companion, 'Peace River Jim' Cornwall gazed at the imposing high black banks of sand, the latter remarked, "They will have to be developed someday, but you and I will not live to see it." Neither of these pioneers of Alberta's Northland lived[1] to see the massive scale of developments that now shatter the peaceful tranquillity of the lonely Land of Peter Pond.[2]

But it was the vision and work of this man, Clark, and others like him—Ells, von Hammerstein, Fitzsimmons, and Ball, who pioneered the methods which made the billion dollar operations possible in the 1970s.

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[1] James K. Cornwall died in 1955; Karl A. Clark died in 1966–two years after Great Canadian Oil Sands gained permission to develop a commercial plant with a 45,000 barrel per day capacity.

[2] Clark, K.A. 1957. *Athabasca Oil Sands, Historical Review and Summary of Technical Data.* Edmonton: Research Council of Alberta, Contribution 69, p.1.

It was only in 1950 that governments and oil corporations officially accepted the facts set forth by S.M. Blair in his report[3] that it was commercially feasible to mine and market the bitumen from the oil sands.[4] The years prior to this were fraught with trials and disappointments.

On June 26, 1715, James Knight, Governor of Churchill, wrote in his journal:

> I had a large description of a river, it runs down into ye other sea beyond Churchill River head or Misshenipih and yet Indian showed me, some salt and brimstone he brought from there.[5]

This is the first recorded reference to the tar sands and the salt located in the area around Fort McMurray.

Although John Richardson mentioned the material in his notes in Franklin's 1823 Journal, it was in 1875 that the botanist, John

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[3] Blair, S.M. 1950. *The Development of the Alberta Bituminous Sands.* Edmonton: King's Printer.

[4] Like a boy tagged with a nickname, the term 'tar sands' sticks, although it is technically inaccurate. Tar is a term applied to the residue of a petroleum refinery process. It is more accurate to call it bituminous sand since the bitumen is a hydrocarbon in its raw form. In early years, it was known as asphaltum at Fort McMurray.

[5] Wallace, J.N. 1939. *Historic Places in Alberta.* Unpublished Manuscript. J.N. Wallace papers, University of Alberta Special Collections Library, Box 2, p. 5.

Macoun observed the phenomenon and in his opinion the bitumen came out of the shale formation.[6]

Throughout the nineteenth century the tarry conglomerate was an object of curiosity to travellers passing through the land. Its main application was in the patching of birch bark canoes and York boats but, to the voyageurs, upstream 'tracking' brought forth oaths of frustration as they sank to their ankles in the black gumbo.

Robert Bell, a geologist for the Geological Survey of Canada, began a closer examination of the oil sands, and in the Report of Progress of 1880-82, the Director, A. Selwyn, stated:

> Dr. Bell believes the source of petroleum to be in the underlying Devonian limestones, and not in the black shales mentioned by Professor Macoun, also that the impregnation has taken place, as in eastern America, from below upward. Neither the eastern nor western limit of this tar-impregnated sand-rock of the Athabasca and Slave Rivers has yet been ascertained.[7]

Bell's belief was reinforced by the fact that the bitumen from these 'springs' was extracted by wooden spatulas and placed in wooden barrels for use at the Hudson's Bay trading posts and missions. An effort was also made to tar the roof of a Fort McMurray house in 1882 but the results were unsatisfactory.

Bell's survey and his theory that the bitumen could be tapped finally spurred the federal government to approve funds for the

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[6] Macoun, J. 1877. *Geological and Topographical Notes on the Lower Peace and Athabasca Rivers.* Ottawa: Geological Survey of Canada, Report of Progress for 1875-1876, Appendix I, p. 92.

[7] Selwyn, A. 1893. *Summary Report on the Operations of the Geological Survey in the Year 1880, by the Director.* Ottawa, Geological Survey of Canada, Annual Report (New Series), Vol. II, Pt. I, p. 26A.

Geological Survey to undertake a series of borings to determine the depth and extent of the oil sand formation. Athabasca Landing and Victoria Mission were the sites of two of the ventures but the most significant site selected was 120 miles downstream from Athabasca Landing at Pelican Rapids. The well was abandoned after 837 feet because a strong flow of gas made further drilling impossible. The rapid expansion of the gas had a chilling effect on the viscous material which had the effect of 'clotting of the casting and tools with the heavy tarry petroleum...'[8]

In 1908, Robert Bell spoke in glowing terms of the tar sands to the American Institute of Mining Engineers at their July meeting in Toronto. He envisaged that:

> The refined oil could be piped to Fort Smith on Slave River, and thence on tank steamers, by way of Mackenzie River, to the northern ocean, which is open from the mouth of this great stream to the Pacific. Or it might be carried by steamers to the waters of Athabasca Lake, and thence piped to Churchill harbor on Hudson Bay.[9]

This was in 1907! He went on to state that the material without any treatment was ready to be utilized for paving, roofing, and as electrical insulation.

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[8] Dawson, G.M. 1901. *Summary Report on the Geological Survey Department for the Year 1898, by the Director.* Ottawa: Geological Survey of Canada, Annual Report (New Series), Vol. II, p. 28A.

[9] Bell, R. 1907. "The Tar sands of the Athabasca River, Canada." *Transactions of the American Institute of Engineers* Vol. 38: 848.

One pioneer promoter had already anticipated Bell's vision. In 1906 Count Alfred von Hammerstein[10] brought in over $50,000 worth of equipment to drill the first exploration well about 15 miles below Fort McMurray. Von Hammerstein hoped to discover the bitumen which was supposedly trapped in pools below the oil sand. In 1907 von Hammerstein was invited to Ottawa to report to the Parliamentary Committee which was investigating the "Resources of the Territory between Labrador and the Rocky Mountains of Western Canada N.W.T."[11]

During his stay in Ottawa, von Hammerstein, after some political maneuvering, managed to acquire 12,000 acres of surface and mineral rights as recognition of his pioneer efforts on the Athabasca River. Although he drilled a number of wells along the Athabasca River, he never succeeded in tapping the black gold believed to be below the sands. However, he did discover salt deposits near the mouth of the Horse River and a salt plant was established at Fort McMurray in the 1920s.

The efforts of von Hammerstein obviously kindled the interests of others who were anxious to exploit new opportunities. In 1911, a small quantity of oil sand was brought to Edmonton, mixed in a street kettle, and laid in two four-foot square sidewalk blocks at the northwest and southwest corners of 101 Street and Jasper Avenue.

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[10] Alfred von Hammerstein came to the Athabasca in 1897 on his way to the Klondike. After reaching Fort Liard, he retraced his steps to Athabasca Landing and subsequently opened a trading post at Baptiste Lake. There he introduced the natives to farming. His prospecting interests along the Peace and Athabasca Rivers led him to begin oil drilling ventures around Fort McMurray. He died in 1941 and is buried at St. Albert.

[11] Chambers, E.J., ed. 1907. *Canada's Fertile Northland: A Glimpse of the Enormous Resources of Part of the Unexplored Regions of the Dominion, Vol. I.* Ottawa, pp. 26-43.

Early in 1913, J.L. Cote, M.P.P., enquired of the federal Mines Branch what information of the tar sands was available.[12]

Sidney C. Ells, the Assistant to the Director, discovered that with the exception of promotional literature, little real data existed. A track survey of the Athabasca River had been completed in 1884 and in 1911 Guy Blanchet had completed the 23rd Base Line Survey. The country north of Athabasca Landing was virgin territory. Consequently, Ells was authorized to come west, and in June 1913, he and his three-man crew, guided by a native pilot, left Athabasca Landing for Fort McMurray. Ells discovered the first tar sand exposure approximately 40 miles above the Fort at Boiler Rapids. During the next three months he reconnoitred the Land of Peter Pond, covering eight tributary streams from the Firebag River in the north to the Christina River in the south. The positions of 247 outcrops were established, photographs were taken, and over 200 samples were collected. Ells also selected an area which became the Horse River Reserve[13] of the National Parks Branch. Consisting of 580 acres along the Horse River, the Reserve (1½ miles south of Fort McMurray) was intended to be a source of paving material for national parks in western Canada.

After he secured a 40-foot scow, a crew of local men, and nine tons of samples and equipment, the expedition began tracking its grim upstream journey. Athabasca Landing was 240 miles distant. The scow leaked, the men suffered from flies, hernia, pneumonia, and appendicitis attacks.

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[12] Ells, S.C. 1962. "Recollections of the Development of the Athabasca Oil Sands." *Information Circular* 139, Mines Branch, Department of Mines and Technical Surveys, Ottawa, July, p.1.

[13] The Reserve was finally transferred to the Province of Alberta in August 1957.

> Twenty-three days after leaving McMurray and about two hours after dark we saw the faint glimmer of lights at Athabasca Landing and soon after we beached our battered and leaking scow. It had snowed or rained throughout seventeen of the twenty-three days. For purposes of comparison with present-day labour conditions it may be noted that, as late as 1913, established custom required that trackers be paid $45 for the trip regardless of the time occupied and that they find their way back to McMurray as best they could and without further remuneration. It was also an immutable custom that they be provided with moccasins and tobacco and I had therefore laid in a gunny sack full of each at a cost of $38. (It may be noted that the tobacco consisted of plugs which were rather badly mildewed.).[14]

In his subsequent report, Ell's chief conclusion was that utilization of the oil sands was commercially possible in paving programs in western Canada. He estimated that "ten acres of bituminous sand, 50 feet in thickness, would supply the paving requirements of the provinces of Alberta, Saskatchewan, and Manitoba, for a period of approximately 24 years."[15] Ells suggested that a practical test would be to lay a demonstration pavement. Through the urging of J.L. Coté, the Edmonton Board of Trade unanimously passed a resolution asking the Minister of Mines to

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[14] Ells, S.C. 1962. "Recollections of the Development of the Athabasca Oil Sands." *Information Circular* 139, Mines Branch, Department of Mines and Technical Surveys, Ottawa, July, pp.12-13.

[15] Ells, S.C. n.d. *Notes on Certain Aspects of the Proposed Commercial Development of the Deposits of the Bituminous Sands in the Province of Alberta, Canada.* Edmonton: University of Alberta Archives, 69-76: 15

make Ells' report public and, furthermore, that the oil sand be tested in Edmonton.[16]

During July and August of 1914, Ells returned to the tar sands where he colleted 1,200 one-hundred pound sacks of oil sand.

> In January and February 1915, in temperatures ranging from 20 to 50 below zero and without tents for men or horses, twenty-three teams from Athabasca Landing broke a trail, for 160 miles down the Athabasca River to a point near Grand Rapids and thence made their way overland as best they could through 85 miles of bush to McMurray. Ultimately, these teams delivered the sixty tons of sand to the Landing without the loss of a single sack.[17]

In May 1915, Ells began topographical surveys and the resulting maps were one of his chief contributions. Early in June, word reached Ells that Edmonton required him to superintend the laying of the oil sand pavement. Setting out on foot with his cocker spaniel, Ells reached Athabasca Landing on the seventh day, feet blistered and swollen. At Edmonton, he arranged to have a mixer shipped in from Grand Rapids, Michigan, and in August 1915, over 600 feet of oil sand, 18 feet wide, were laid on Kinnaird Street (now 82 Street) south of Alberta Avenue (118 Avenue).

Some of the wildly speculative schemes were also placed in proper perspective because Ells pointed out that no one had really considered the problems of transportation, variation in mixture of the material, and the overburden which had to be removed. Speculative ventures were made possible through the liberal leasing policy of the

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[16] 1914. *Edmonton Bulletin*, February 11: 8.

[17] Ells, S.C. 1962. "Recollections of the Development of the Athabasca Oil Sands." *Information Circular* 139, Mines Branch, Department of Mines and Technical Surveys, Ottawa, July, p. 22.

federal government. Although the right to purchase land with mineral rights had been withdrawn, bituminous land leases could be acquired at a yearly rental of fifty cents an acre. In 1920, the area was placed under Government reserve. A lessee was required to prove that he held a feasible process for extracting the oil from the sand. Consequently, the 1920s witnessed a rash of schemes for extracting the bitumen. It was not until 1930 that new regulations reduced the number of 'get rich quick' ventures.[18]

Ells was to remain in charge of the fieldwork undertaken by the federal Department of Mines until his retirement in 1945. To Ells, however, the task became a labour of love. He travelled to the United States so that he would be up-to-date in American projects. As a promoter of the oil sands, he spoke, lectured, and wrote letters to business, industry, and government. His efforts were not in vain, but as he had also indicated, some of the ultimate values of the oil sands would be in the discovery of a method which would separate the bitumen from the sand. In the long run, road paving was cheaper by use of oil from the conventional oil fields of Alberta, and as Ells clearly foresaw, transportation costs prohibited road paving programs on a major scale.

One individual who persisted with a road-paving enterprise was Thomas Draper, who formed the McMurray Asphaltuim and Oil Company in 1922. Draper hoped that the newly arrived Alberta and Great Waterways Railway would make a road paving company feasible. After establishing a quarry at the first site of Waterways (where the railroad drops into the Clearwater valley), Draper sold his products to various municipalities in the 1920s. In 1923, the Alberta government purchased 185 tons of oil sands, which was laid as an experimental project on the St. Albert Trail. Although the pavement tested favourably, it became obvious to Clark that mining and

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[18] Clark, K.A. 1930. "The Bituminous Sands of Alberta." *The Monetary Times,* December.

transportation costs were too high to permit competition with conventional asphalt.[19]

During the period between 1897 and 1925, approximately 40 holes were drilled in the area by hopeful venturers. Although none were successful, about half had struck the oil sands formation. These efforts along with the surveys conducted by S.C. Ells resulted in the identification of major outcroppings and over 1,260 square miles were topographically mapped.[20]

Road paving proposals, however, brought the tar sands into prominence and Henry Marshall Tory, President of the University of Alberta, shrewdly persuaded his Board of Governors in 1914:

> ...to see whether arrangements could not be made to have the University of Alberta undertake an enquiry on the subject of Road Making with the materials available in the Province.[21]

Following World War I, the University took up the matter in earnest, and in 1919, the Science Association of the University recommended that the bituminous sands be fully investigated. J.L. Cote, who was

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[19] Clark, K.A., and S.M. Blair. 1927. *The Bituminous Sands of Alberta.* Edmonton: Scientific and Industrial Research Council of Alberta, Report No. 18, Pt I, p. 9.

[20] 1949. *Drilling and Sampling of Bituminous Sands of Northern Alberta: Results of Investigations.* Ottawa: Department of Mines and Resources, Report 826, Vol. 1: 1

[21] . 1914. *Board of Governors' Minutes 1913-18.* Edmonton: University of Alberta Archives, 71-164-1, April 4.

now the Provincial Secretary, met with Dr. Tory and from their deliberations, the Scientific and Industrial Council was formed.[22]

In 1920, Dr. Tory invited Karl A. Clark, who was with the Road Materials Division of the Geological Survey in Ottawa, to become head of the Road Materials Division of the Research Council. For the next 34 years, Clark was the scientific leader in pioneer attempts to separate bitumen from the sands. His work made the present-day developments possible.

The road paving program in 1923 convinced Clark that the effective utilization of the sands was in discovering a workable separation process. Robert Bell had suggested use of a solvent (which proved impractical for commercial production) and *in situ* distillation had been attempted in 1920 near Fort McMurray. A hole was drilled into the sands and a heater was installed at the bottom of the hole. About 1920, General W.B. Lindsay obtained several leases and attempted to apply steam in an effort to distill the bitumen. These, and other costly efforts (reputed to be in the neighbourhood of $800,000) ended in failure. The hot water process was first experimented with by G. Hoffman of the Geological Survey of Canada in the 1880s with satisfactory laboratory results.[23]

Clark thereupon began designing a hot water separation plant which operated in 1923 in the basement of the University's Power House. In 1924, the plant was further modified and moved to Dunvegan Yards. By 1925, the experiments were judged to be satisfactory.

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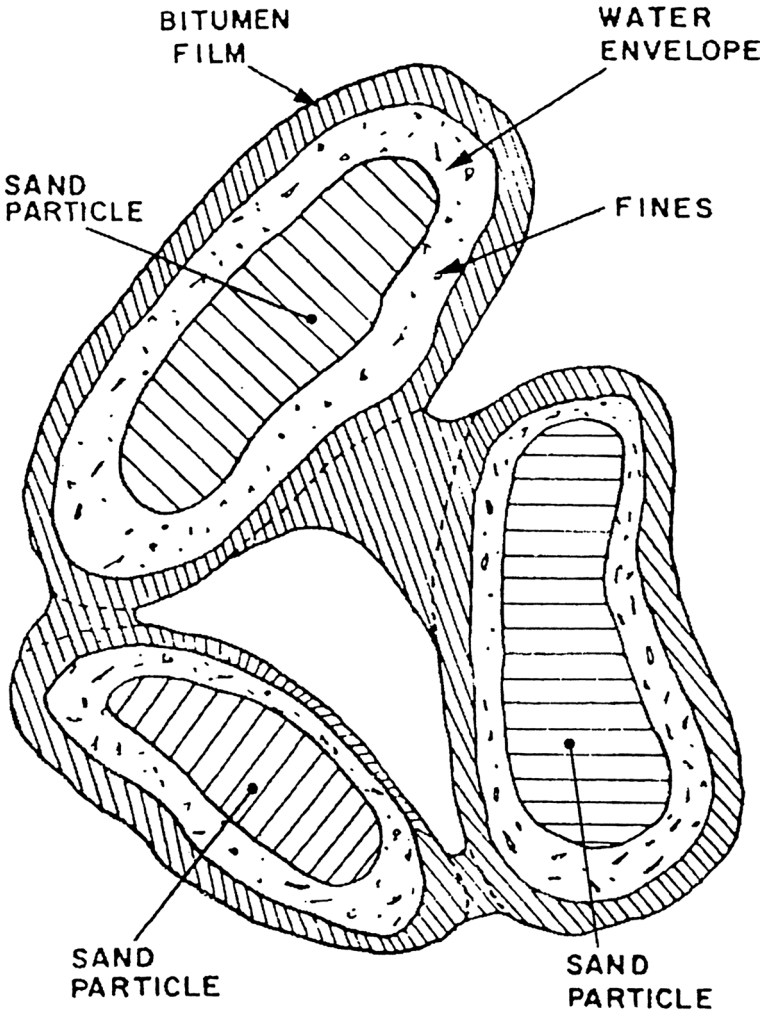
[22] By Order-in-Council 30/21 January 6, 1921, the Council formally came into being. In 1930, Bill No. 127 was passed and the Research Council of Alberta succeeded the Order-in-Council.

[23] Ells, S.C. 1962. "Recollections of the Development of the Athabasca Oil Sands." *Information Circular* 139, Mines Branch, Department of Mines and Technical Surveys, Ottawa, July, p.85.



Oil, sand, and water. University of Alberta archives.

In May, 1929, representatives of the Alberta Research Council, and the Deputy Minister of Mines, Dr. Charles Camsell, met in Edmonton to formulate a cooperative scheme for utilization of the oil sands.[24] It was agreed that the Research Council should "proceed with the erection of a semi-commercial separation plant" near Fort McMurray.[25] The purpose of the plant was to find out whether the laboratory hot water process could be applied on a commercial scale. The Dunvegan Yard Plant was dismantled, shipped to Waterways, and re-erected on a site near the federal mines quarry about half a mile below Waterways.

Arriving in Waterways in the early afternoon of May 7, 1930, Clark described the scene:

> Waterways presented quite a change. There were a number of new houses back along the road from Burton's place. (Burton ran the hotel). Also there was a new restaurant to the east of his place. At the waterfront, the Hudson's Bay Co. had a boat under construction. It is about 75 feet long and is to be equipped with diesel engines. Down past the Hangingstone there were four barges being built. One is an extra big one. The place was full of men. It seems that the newspaper reports of millions of dollars of tar sand development about to take place had started a

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[24] The Bituminous Sands Administrative Committee resulted from this meeting, Under the *Natural Resources Act*, $30,000 was committed to the Research Council Plant. It is interesting to note the sums expended on these were minimal, even by standards of those days; S.E. Ells estimated average annual expenditures of $15,000 for this department, and K.A. Clarke said that, except for 1925 when $15,000 was allocated, annual expenditures were much less than $10,000.

[25] Clark, K.A. 1929. "The separation of bitumen from Alberta Bituminous Sands," *Transaction of the Canadian Institute of Mining and Metallurgy*, Vol. 32, p. 349.

> hundred men or more to McMurray after jobs. The Hudson's Bay Co., have moved or expanded their office into the end of the warehouse.[26]

It was certainly a busy summer for Karl Clark and his crew but by August the plant had processed, with fits and starts, some 800 tons of oil sand which yielded 15,000 gallons (75 tons) of bitumen. Clark concluded:

> The completion of the two year program of development has resulted in notable advances in bituminous sand operation. A separation plant has been built and successfully operated in the north country at the deposits. This has had psychological as well as technical value and has probably done as much to direct public interest to Alberta's bituminous sand resources as all the previous studies at Edmonton... The northern... plant produced a bitumen which was comparatively free from these impurities and which was used as commercial asphalts...[27]

Although the people at Fort McMurray and Waterways anticipated a new era—after all, the Dominion and Provincial Governments had agreed on a transfer of natural resources to the latter's jurisdiction[28] —other factors were to intervene. With the onset of a depression, neither the Research Council nor the Government could afford to

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[26] Clark, K.A. n.d. *Diary–Season at Bituminous Sand Separation Plant, Clearwater River, 1930.* Edmonton: Provincial Archives of Alberta, Karl Clark Papers, A68.15: 1.

[27] Clark, K.A., and D.S. Pasternak. 1930. *Road Materials Division Report.* Edmonton: Eleventh Annual Report of the Research Council of Alberta, p. 61.

[28] The agreement was signed on December 14, 1929.

develop the oil sands,[29] especially when there was an overproduction of petroleum in the United States. As has been pointed out, the use of oil sands in paving programs was prohibitive in cost, and although Clark had noted the increasing demand for petroleum for motor cars in Alberta,[30] many of them were destined to become 'Bennett buggies' in the 'Dirty Thirties.'

The transfer of natural resources also brought new lease regulations which stringently curtailed the wildcat ventures of the 1920s. These regulations provided that a lessee had to prove, to the Government's satisfaction, that he had the "right to use a process for the recovery of oil from the bituminous sands which gives promise of a successful practical application."[31] Only two men had the daring and the entrepreneurship to carry on. One was M.W. (Max) Ball and the other R.C. (Bob) Fitzsimmons.

The former led a group of Denver businessmen to negotiate for acquisition of the Clearwater plant. Although the sale never was completed, Ball persisted and in 1936 Abasands Oils, Ltd. began construction of a 400-ton (daily) plant on the northern portion of the House River Reserve. Separation processes and mining difficulties (abrasive sand) caused the project to limp along until the early 1940s. The bitumen was refined and the products transported in a pipeline to the Waterways railhead. The diesel oil was sold to northern mining companies but high sulphur content in the gasoline prohibited its

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[29] Clark, K.A. 1929. *The Bituminous Sands of Alberta.* Edmonton: Scientific and Research Council of Alberta, Report No. 18, Part III, p. 28.

[30] Gasoline consumption increased from 12,062,000 gallons in 1923 to 40,900,000 gallons in 1928 (Clark 1929).

[31] Clark, K.A., and D.S. Pasternak. 1930. *Road Materials Division Report.* Edmonton: Eleventh Annual Report of the Research Council of Alberta.

sale. It was, however, used in company vehicles. Wartime conditions frightened the Federal Government into doing something about petroleum supplies in western Canada. A committee investigated the oil sands situation. Its recommendations were that the Abasands operation be closely studied and that drilling operations be undertaken to determine the location of extensive deposits.

Ball dismantled his plant in 1942 so that it could be rebuilt to (hopefully) yield more effective results. However, the Federal Government took over the Abasands plant and attempted to put it into production. The entire project sputtered along until a spark from a welder's torch set off a fire which destroyed the plant on June 15, 1945. The Federal Government's efforts were abandoned after a cost estimated to be in the neighbourhood of $2,000,000.[32]

The drilling program, however, had succeeded in overcoming the problems of boring into the sands. Diamond core drilling and drilling mud supplanted the old auguring process. Two hundred and ninety-one holes were drilled during the 1943-47 period, and the data obtained contributed significantly to knowledge of the oil sands.[33]

The Alberta Government, not satisfied with the Federal Government results, announced it was going to build a separation plant to demonstrate that separation of the bitumen from the sand was possible. The site selected was Bitumont.

Back in 1914, S.C. Ells apparently persuaded some city policemen from New York to take out a lease under the Alcan Company name. The lease was situated about 50 miles downstream from Fort McMurray. Drilling for oil proved to be futile and, in 1923, Bob Fitzsimmons took over and formed the International Bitumen

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[32] Ells, S.C. 1962. "Recollections of the Development of the Athabasca Oil Sands." *Information Circular* 139, Mines Branch, Department of Mines and Technical Surveys, Ottawa, July, p. 94.

[33] "Drilling and Sampling...". *op cit.*

Company.[34] By 1930, he too realized that no oil pool was to be found, so he set up a small separation plant which was named Bitumont Post Office. For the next decade Bob Fitzsimmons gradually improved his operation. Because the oil sand around Bitumont is less viscous than that on the Horse River Reserve, he was able to quarry sufficient material for his operation. (Unlike Abasands, the International Bitumen Company did not have a refinery). Financial difficulties forced the sale of the company in 1942 to L.R. Champion, who renamed it Oil Sands, Limited.

Although the Alberta Government originally entered into an agreement with Oil Sands, Limited, by 1948 this company was unable to meet its financial obligations. Therefore, the Bitumont plant was taken over by the government. By 1949, the plant was enlarged to separate 500 tons of oil sand daily and a refinery was added. Operations proceeded very well and the government now faced the question—where do we go from here?

During September 1949, an old friend and former student of Karl Clark in the 1920s, Sidney M. Blair, visited Bitumont. His opinion was that little would be gained from continuing the Bitumont operation.[35]

> It had served its purpose which was to demonstrate, technically, there was no obstacle in the way of separating the oil from the oil sands. What was now needed was an estimate of the cost of a barrel of saleable oil sand, separating the oil, processing the oil to

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[34] 1949. *Drilling and Sampling of Bituminous Sands of Northern Alberta: Results of Investigations.* Ottawa: Department of Mines and Resources, Report 826, Vol. 1: 1

[35] Clark, K.A. 1957. *Athabasca Oil Sands, Historical Review and Summary of Technical Data.* Edmonton: Research Council of Alberta, Contribution 69, p 15.

> a marketable product and delivering this product to a large marketing area...[36]

Blair was retained by the Board of Trustees to conduct the survey and his report was presented in December 1950. His figures indicated that a cubic yard of oil sand should yield one barrel of oil (cost $3.10) in a 20,000 barrel-per-day plant. Based upon a market value of $3.50, commercial development was possible. Subsequently, the first Athabasca Oil Sands Conference was held under the auspices of the Provincial Government in Edmonton during September 1951.[37]

The long technological search was essentially over. The next two decades witnessed an increasing interest in the black sand. The lonely Land of Peter Pond was first an Eldorado for the great fur trading companies[38], now it appears as an Eldorado to the giant consortiums which seek to exploit the black sticky gold embedded in the sand.

Other Sources

The technical data are very extensive and the reader is directed to the *Index to the Published Literature on the Athabasca Oil Sands, 1789-1970*, published by the Research Council of Alberta, as a guide, although S.C. Ells "Recollections" and K. Clark's "Historical Review" cited above are good general summaries.

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[36] Blair, S.M. 1950. *The Development of the Alberta Bituminous Sands.* Edmonton: King's Printer, p. 75.

[37] 1951. *Proceedings, Athabasca Oil Sands Conference.* Edmonton: Government of Alberta, September.

[38] Rich, E.E. 1960. *The History of the Hudson's Bay Company, 1670-1870, Vol. II.* Toronto: McClelland and Stewart, p. 209.

Chapter 10

On Stream

Present and Future Oil Sand Development

Gerry Lock

The size of the Athabasca oil sand deposit—the largest in Alberta—is unbelievable. It underlies an area of almost six million acres, or 9,000 square miles, and is covered by an overburden ranging from zero to 2,000 feet in depth. It is known that this single deposit is several times greater than the entire Arabian oil reserve. To appreciate its immensity, consider the fact that it could cover the whole of Alberta, several feet deep! The most recent estimates of the Alberta Energy Resources Conservation Board indicate that 700 billion barrels of oil are contained in it. This should be enough to last a lot of people a long time.

The map on page 18 (Figure 3) shows the extent of the Athabasca deposit. Also shown on page 80 (Figure 5) are the principal waterways, the town of Fort McMurray and other centres. The bituminous sands are found in both the McMurray and Clearwater Formations but most typically in the former. They consist predominantly of fine-grained sand fully impregnated with oil and have been observed from the earliest times in outcroppings. Their thickness, like the overburden above them, varies from place to place but appears to increase from less than 50 feet near the western edge to over 200 feet in the east. The presence of the oil dictates many of the characteristics of the sand and, in particular, it plays an important

role in its strength. With regional air temperatures ranging from -40°F to +90°F (-40 to +32C) it is not surprising to find the behaviour of the sand varying accordingly, from rigid to runny.

To obtain the oil from such a deposit, it is essential to know three things: how to reach it, how to remove it, and what to do next. Let us defer discussion of the third point until later and concentrate on the first two. The answer to the very first question—how to reach it—is deceptively simple. Remove the overburden. But this varies so greatly both in nature and thickness that no single method has been developed to cope with it. However, it has been possible to develop one approach for shallow overburdens (less than 150 feet) and another for deep overburdens (greater than 500 feet), leaving a fraction (some 20%) of the deposit inaccessible by either method.

A shallow overburden can be removed layer by layer, starting with the vegetation. Below this is swampy muskeg which cannot support heavy machinery unless it is frozen. Muskeg is also easier to excavate while frozen. Thus, the removal of both vegetation and muskeg are usually done during successive winters, with intervening summers being used to drain off as much of the water as possible. The overburden proper, consisting of sand, clay, and boulders, is then removed layer by layer until an economic grade of oil sand is reached.

From this point on, the operation closely resembles conventional open-pit mining in which large steps, or benches, are cut progressively into the deposit as it is removed. These steps can be as high as seventy-five feet above each other. The sloping face between two step levels is gradually cut away by machines, care being taken to ensure that the face slope never becomes steep enough to allow it to collapse, to the detriment of both men and machines.

Two very different types of mining machine are currently under construction and the success of each will undoubtedly determine its use in the many ventures to follow. The first type—the only one yet in operation—is the bucket wheel excavator which, as its name implies, consists of a rotating wheel of buckets constantly scooping

away great chunks of sand which it drops over its shoulder onto a conveyor belt. As the face slope is eaten away in sweeping arcs, the machine inches forward along the side of the step, thus leaving behind a new face along which the process is repeated again and again, slice by slice. This method of mining looks perfectly straightforward until the characteristics of oil sand are taken into consideration. In the winter it is hard and the sand itself is so abrasive that the metal teeth—each of which weighs one hundred pounds—can be worn out within eight hours! In the summer, cutting is easier because the material is softer: so soft, in fact, that it will bog down all but the lightest traffic. Parking becomes permanent. The oil sticks stubbornly to everything and in order to prevent machinery from clogging, it is necessary to wage an unceasing war.

The other contender in the mining stakes is the dragline, sometimes called the walking dragline because, unlike the bucket-wheel excavator, it is not provided with tracks for crawling. Instead, it moves on a special mechanism with the grace of a giant dragging himself along on a dwarf's artificial legs. In essence, a dragline consists of a large arm, or boom, suspended from which is an enormous bucket. When this bucket is dragged by the mouth over the surface to be mined it is capable of scooping up large amounts of material which are then lifted, crane-like, and dumped onto a conveyor. Thus the dragline operates through repeated applications of its scooping–raising–dumping cycle. The use of a single large bucket promises to make the dragline much less sensitive to the teething problems experienced with bucket wheels. However, no one has yet tried to operate such a large machine from the top of an oil sand slope. If the slope were to slide, the results could be catastrophic.

When the overburden is much deeper than 150 feet, it becomes increasingly expensive to remove and increasingly difficult to stockpile on a limited acreage. A method other than mining is then required. This is provided by the method known as *in situ* recovery, which is borrowed from the conventional oil industry. It consists

quite simply in drilling a hole down through the overburden into the deposit and then allowing the oil to flow out the hole. Unfortunately, the oil in oil sand shows no natural inclination to flow up the hole and it must be persuaded to do so. Persuasion is the key to the operation and takes two principal forms: conventional and nuclear.

In situ recovery attempts to release the grip which the oil coating has on the grains of sand and this may be done in a variety of ways, separately or in combination. In conventional recovery, the deposit may be heated through steam injection, or combustion, which occurs in artificially-produced horizontal fractures. These fractures are created by a high-pressure fluid and must be carefully controlled to run between two wells, one from which the injection is controlled and another from which the oil emerges. Injection with heat warms the oil and makes it less viscous so that it will flow easily if a pressure is exerted behind it. Much the same effect can be produced by injecting certain chemical agents which may either dissolve the oil or capture it in the form of an emulsion. The resulting liquid is much less viscous than the original oil and is therefore easier to pump out from the producing well.

The use of a controlled nuclear 'explosion' is another way of producing the same effect—the heating of large volumes of the deposit—but it requires exceptional care. The overburden is seldom thick enough or strong enough to withstand excessively-high pressures which could not only produce horizontal fractures but could lift the overburden off entirely. What might take years with conventional strip mining would be accomplished in a few seconds! To prevent this, the release of nuclear energy takes place at a substantial depth and in a carefully-controlled manner. It thus has the advantage of producing the desired fractures in a region which essentially contains the entire heat release for a period of about two years. The warm oil is then pumped out through a surrounding ring of producing wells.

So much for reaching and removing the oil. The question now is what to do next. In the case of *in situ* recovery, the oil is free of the

sand, at least nominally, but in a mining operation—the only type yet operating or planned—the lumpy deposit needs further treatment. As fast as it is removed from the mine face, the oil sand is collected by a series of speeding conveyor belts which transport it to a separation and extraction unit. There it undergoes a number of operations beginning with what is sometimes called 'conditioning.' Very simply, this is merely mixing the oil sand with steam and caustic soda to liberate the bitumen. The mixture is then passed into a separation cell, which, as its name suggests, separates the sand from the bitumen by allowing the former to settle and the latter to float to the surface where it is skimmed off. Finally, the bitumen is diluted and centrifuged to remove the last traces of water and mineral particles.

Bitumen produced in this way is a commercial product but it does have certain limitations, not the least of which is its sulphur content. To obtain a better product the bitumen is upgraded by further processing in which ash, sulphur, nitrogen, and metals are removed, converting the black bitumen into a straw-coloured oil known as synthetic crude. In fact, the upgrading actually generates four new products:

1. Light gases, which are used as fuel;
2. Naptha, which can be further upgraded to make gasoline;
3. Kerosene, for jet fuel; and,
4. Gas oil, a heavy fuel oil.

It is the last three, blended together in the rough proportions of 6:4:7, respectively, which make up the synthetic crude oil. But synthetic crude is not the only product to emerge from the plant. Fuel gas and gas oil are both bled from the process and consumed elsewhere on the site. In addition to these, coke and sulphur are produced, the former being consumed and the latter stockpiled. Five barrels of bitumen produce four barrels of synthetic crude, and there are virtually no waste products—except tons and tons of sand.

Most of the sand is extracted during the separation process and is known as tailings. Bitumen production is actually a very efficient process yielding 90% of the oil originally contained in the mined deposit. Thus the sand emerges relatively free of oil and is pumped as a slurry into large tailings ponds where it settles out to form what will eventually become new land. Perhaps there are no waste products after all.

What will happen to all the oil produced? It would seem that with such a massive reserve we could go on producing oil indefinitely. However, the facts speak otherwise. The Alberta Energy Resources Conservation Board predicts that conventional crude oil production in Alberta will soon level out at slightly less than 2,000,000 barrels per day and after 1975 it will begin to decrease. To find out what happens then requires a crystal ball, although there are several known possibilities.

We could consume less energy, but such a suggestion is likely to receive a cold reception in a cold climate. We could export less and risk economic and perhaps political retaliation from nations who have thus far shown little tendency to consume less themselves. Or, we could produce fuel and feedstock from other hydrocarbon deposits, principal among which are coal and oil sand. Given the alternatives, it is very likely indeed that the last possibility will become a reality; and on a massive scale.

The demand for western oil in Canada alone continues to rise rapidly and before 1980 it will actually have exceeded the supply from conventional sources. Beyond that time it is difficult to see how this demand can be met without oil sand development. In fact, without such development, the demand could exceed the supply by an extra 200,000 barrels per day (10% of maximum production) for each year after 1980. To prevent this would require two new oil sand plants a year, each with a production capacity of 100,000 barrels per day. The only plant in operation today—and for the next several years—has a production capacity of about 50,000 barrels per day. The production schedule published by the Energy Resources

Conservation Board allows for four mining operations before 1983, following which it has been assumed that *in situ* recovery will be well advanced. This is an important assumption because only about 10% of the Athabasca deposit is recoverable by mining. The bulk of the deposit is virtually useless until *in situ* technology has reached the commercial stage.

The giant of demand has an unholy appetite and will seek to satisfy it. There is little point in moralizing on this fact for, as Pogo has said with characteristic insight, "We have met the enemy and he is us!" The more the giant of demand is fed, the more he grows; and the more he grows, the more he demands. Only when he reaches the clear and unequivocal realization that he cannot possibly eat as much tomorrow will he voluntarily control his appetite. But until such time as the giant of demand accepts a diet, we have little choice but to match him with the giant of supply and let them consummate their marriage according to the laws of economics. Of course, the artificial control of demand can help to some extent, but it may not be enough. The rising price of oil, for example, has hardly changed the demand at all in recent times, although this situation could well change by 1980. And then again, even should the control be effective, it would bring forth an earsplitting roar of protest—our own!

Alberta's giant oil sand resource puts the province in an enviable position to meet a large part of the burgeoning demand for hydrocarbons; a demand which is not only for fuel but for the petrochemical feedstock so essential to the production of synthetic materials used for clothing, appliances, and construction. In fact, the province now has a unique opportunity to develop a flourishing petrochemical industry with all the attendant advantages to labour and industry of high value added close to the material source. But before this can be done, it will be necessary to build many oil sand plants each with its own infrastructure. And before these are planned it will be necessary to organize and develop a substantial technological work force, and create a stable and equitable climate for investment. Since all of this is being done for society at large it is

extremely important to ask what it will do to the Land of Peter Pond, and to the people who make that land their home.

Resource development on such a large scale is bound to be an upheaval. For the land itself, this is a literal truth which poses a difficult ecological question. To what extent can we disturb the balance of nature and not invite disaster? More particularly what modifications to the air, water and earth—and the life they support—can be tolerated without undesirable consequences? The relevant requirements which must be met by the developers are essentially under the jurisdiction of the Alberta Department of the Environment. Under the *Clean Air Act,* the Department is concerned with the control and monitoring of atmospheric emissions such as sulphur dioxide, oxides of nitrogen and particulates, including smoke. Each oil sand plant is required to provide a monitoring program designed to assess plant operations and their associated air contaminant emission characteristics. Under the *Clean Water Act*, the Department has accepted the so-called 'waste water management concept,' in which all plant water within the company's lease is impounded in perpetuity. The control of surface run-off, together with the maximum reuse of process waste waters from the pit, extraction and upgrading units, and the utilities plant, thus ensures that any demands placed on the Athabasca River will be minimal. In fact, they are estimated at less than 10% of the minimum monthly flow of the river when as many as ten mining operations are in full production. This is considered acceptable.

Turning now to the land itself, there are several different but interrelated aspects to be considered: topography, vegetation, and wildlife. Digging enormous pits is bound to lead to a resculptured landscape, despite the fact that tailings and overburden material will be replaced and redistributed as the mine is worked. Of itself, this is not necessarily detrimental, provided that the fill is not unstable, or biologically unacceptable. The limited experience gained thus far indicates that the land can be reclaimed and revegetated over a period of several years. However, it is not yet known how topographical and

chemical alterations would limit the rate of return to the original climax boreal forest succession, much of which can support logging activity. Similar doubts exist with respect to the return of wildlife, which is linked intimately to the habitat of the region. It has long been known that many mammals (wolf, lynx, bear, deer, moose, caribou, and buffalo) and fish (walleye, pike, goldeye, trout, and grayling) are common to the region; it also lies on a waterfowl migratory flyway.

Exploration, site preparation, and mining will have a dramatic effect not only on the wildlife of the region but on the people, both indigenous and immigrant. The native population have long depended on hunting, trapping, and fishing for their livelihood, if not their survival. In this century, these traditional activities have been augmented or replaced as some of the natives have become loggers and hunting guides. All such activities are affected adversely when large tracts of land are cleared. For the many who will choose it, this will mean a very difficult change in lifestyle from a simple, closely-knit, traditional community, to an open, complex, technological society. A successful transition will require careful planning and funding, but above all, it will demand a great deal of patience and understanding.

The difficulties of immigrants employed by the developers will likely be much less acute but they are aggravated by the problem of scale. It is estimated, for example, that a typical mining operation would require over 2,000 permanent new dwelling units, each accommodating an entire family. This requirement is difficult enough to meet but will be compounded by the attendant demand for schools and recreational facilities, to say nothing about municipal services and commercial developments. Additional employment during plant construction will add yet a further burden. It is not difficult to see what an acute shortage of these amenities does to the price that must be paid for them; and what that, in turn, implies for both the standard and cost of living.

Again and again, we return to the effects which a large-scale technological development can have on our society. In the western hemisphere, such developments are most often undertaken by industry and permitted by government on behalf of society. The intent is to reap benefits. But world-wide experience during this century has shown repeatedly that technological impact is exceedingly complex. The penalty for haste has been waste; of energy, of raw material, of land, of money, and worst of all, of people. The crises of the last decade have generated grave international concern and have finally given birth to a new approach to technology, *technology assessment.* This consists of establishing an overview of technological developments before and during their lifetime. To do this it is necessary to determine the potential (or actual) impact in not only economic terms but in ecological, social, and cultural terms also. Equally important is the need to recognize that these different impacts are interdependent and cannot, therefore, be treated in isolation from each other. It is necessary to weave them into an integrated picture of the whole impact. For example, to proceed solely on an economic basis leaves no incentive to avoid degradation, whereas excessively tight pollution regulations may render a project uneconomic. Similarly, training of a native work force generates employment (and hence economic) opportunities for the natives who may then suffer a social and cultural loss. The need is for a comprehensive overview.

A thorough assessment of technology has many other dimensions, such as the soliciting of public opinion, the accommodation of aboriginal rights, and the resolution of jurisdictional problems. The Government of Alberta has already given implicit acknowledgement to the importance of technology assessment, through its leadership in such activities as the Peace-Athabasca Delta Project, which is a good example of careful assessment. It is imperative that the same careful assessment be made of oil sand development. For only then can the Land of Peter Pond yield its bounty without the loss of either dignity or natural beauty.

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Index

A

Abasand Oils, Ltd. 128 (map), 155-157
Aboriginal rights 168
Adventures of England Trading 51
agriculture 16
aircraft 49, 113
airfields 133
Ajjercon, Oliver 48
Aklavik 91, 114-116
Alaska 21, 93, 105, 133-134, 147
Alberta 33, 39-41, 43, 48, 84, 95, 106, 138-139, 141, 149, 159
Alberta Avenue (118 Ave) 148
Alberta Department of Environment 166
Alberta Department of Railways 132
Alberta Energy Resources Conservation Board 159, 164, 168
Alberta Gazette 112
Alberta Government 117, 121, 132, 135, 149, 154, 156-157, 168
Alberta and Great Waterways Railway (AGWR) 74, 96, 101, 105, 130, 149
Alberta Housing Corporation 135
Alberta Research Council 19, 151, 153-154, 158
Alberta Salt Company 132
Alberta Soil Survey 16
Alberta Vocational Centre 137-138
Alcan Company 156
alcohol 39, 46
alder 25
Algonkian 33
Allan, Dr. J.A. 132
Allarco Developments 138
American Institute of Mining Engineering 144
Anglican Church 40, 47
annuity/ies 48
Anzac 117
Arabian Oil Reserve 159
Arctic 53, 62, 71, 74, 91, 93, 104, 106, 113-114, 130-131
Arctic Circle 115
Arctic Ocean 102
Arctic Ocean Railways 95-96
Armstrong, J.B.
aspen 13, 21-22, 26-27, 30
asphalt 150, 154
Associated Airways 117
aster 26
Athabasca 129, 145
Athabasca Lake (*see also* Lake Athabasca) 84, 144
Athabasca Landing 74, 77, 130, 144-148
Athabasca Oils, Ltd. 132
Athabasca Oil Sands 2, 159
Athabasca Oil Sands Conference 158
Athabasca Railway Company 96
Athabasca Rapids 2, 131
Athabasca River 1, 5-6, 9, 13, 17, 21, 23-24, 30, 39, 41, 43, 46, 58, 61-62, 65, 68, 73, 77, 81, 84, 86-90, 93, 101, 104, 107, 111, 113, 118, 120, 124, 127, 131, 136, 141, 143, 145-146, 148, 166
Athabasca River, S.S. 78, 85, 89
Athabasca Tar Sands 107,
Athapascan 42
Athapascow Lake House 66
Ahthay, Louise 48
atomic bombs 115
aviation 113-120

B

Back, George R.N. (Captain) 56
Ball, M.W. (Max) 141, 155
balsam fir 12
balsam poplar 12-13
Bannerman 115
Baptiste Lake 145
barge 131, 133, 153
Barnegat 109
barter 34
Batcheller, F.I. 132
bead work 38
bear 27, 28, 166
bearberry 28
beaver 22, 25, 37, 39, 51, 110
Beaver (aircraft) 116
Beaver Indians 34, 37, 40, 42, 43
Beaver Lake 43
Beaverlodge (***see also*** Uranium City) 93, 118-119
bedrock 5
bedstraw 26
Bell helicopter 119
Bell, Robert 143-144, 151
'Bennett buggies' 155
Berens Fort 71
Berens House 69, 70, 71
Bewrens River 71
Big Bay 109
Bigstone Portage 58
Birch Mountain 3
birch 12, 22, 25, 26
bird 37
bitumen 26, 111, 142-143, 145, 147, 149, 151, 154-156, 163
Bituminous Sands Administrative Committee 153
Bitumont 156-157
Blair, Sidney M 142, 157
Blanchet, Guy 146
bluebells 26
blueberries 28, 30
bluegrass 25
boarding school 47
bog (*see also* muskeg) 22
Boiler Rapids 146
Bompass, Bishop W.C. 40, 47
boom 129, 139
boreal forest 12, 21, 22, 31, 166
Boucher, Adam 48
Bourassa, Father Joseph 40, 47
Boyle 107
brimstone 142
Brintnell, Leigh 114-115
Bristoll Freighters 119
British Army 54
Browne, Captain Owen 87
buffalo 45, 166
Buffalo Lake 65
Burnt Point 83
bush workers 42
bust 139
Butler, William 46

C

California
Camsell, Charles (Dr.) 153
Can-Amera 138
Canada Airways Ltd. 116
Canada jay 27
Canada Post 115, 157
Canada West Construction Company 96
Canadian National Railway (CNR) 96, 101
Canadian Government 41, 47
Canadian Pacific Airlines (CP Air) 116
Canadian Pacific Railway (CPR) 77, 101, 107
Canadusa 89
canoe 16, 21, 25, 38, 61, 77, 143
CANOL pipeline 91, 133
cannibal 36
Carbondale 108
caribou 42, 44-45, 166
Cascade Portage 58
Catholic 39-40, 78, 137
caulking 16
Chambers, E.J. 145
Champion, L.R. 157
Chandelle, Paulette 48
Chanel des Quatres Fourches 63
Chard 109, 111
Charles II 51
Cheecham Hills 3
chicakdee 27
Chipewyan Indians 33, 42-49, 53
Chipewyan Reserve 49
choke cherry 23, 26
Christian/ity 40, 47
Christine River 100, 146
Christmas 68
Churchill Factory 53
Churchill Harbour 144

Churchill River / Basin 5, 34, 43, 51, 53, 142
Clark, Carl, A (Dr.) 19
Clark, Karl 141, 151, 153-154, 157
Clarke, John 68
Clean Water Act 166
Clearwater Formation 159
Clearwater Plant 155
Clearwater River / Valley 2, 6, 9, 13, 14, 17, 56, 58, 62, 66, 68, 74, 77, 86-88, 93, 97, 100-101, 104, 111, 113, 121, 127, 149, 155
Clouston, Robert 71
Coachways (buses) 124
coal 164
Coffin, Bob 109
coke 163
Cold Lake 39, 47
Cold Lake Reserve 48
Cold War 92, 105, 133, 137
coltsfoot 26
Commerical Airways 116
Commercial & Western Canada Airways 116
Commission Conklin 109-111
Connecticut 54, 63
Consolidated Mining & Smelting 90
contaminant emissions 166
Cook, John 55, 62
copper 55
Coppermine River 44
Cornwall, J.K. 96, 141
Cote, J.L 146-147, 150
Cottee, C.H.F. 132
cotton grass 29
cranberry 23, 26
crane 29
Cree 33, 42-43, 47, 53, 69
cretaceous 3, 17
Cronkhite, R.H. 122
crude oil 16, 134
culture 46
Cumberland House 54, 65
Cumberland Lake 73

D

Dawson 115
Dawson, G.M. 144
DC-3 119
DC-4 119
defence 93
De Meuron Regiment 70
deer 25, 27, 35, 37, 39, 166
delta 9, 83
Department of Highways 121
Department of Lands & Forests 14
depression 154
Detroit 54
Devonian 17, 143
Devonian Age 3
DEW line 93, 117
Dickins, C.H. "Punch" 114
diesel 153, 155
Dirty Thirties 101, 155
diseases 46
District of Mackenzie 114
doctor 45
Dogrib 42-44
dog sled/train 129
dogwood 25
dolomite 3
Dominion 154
Dr. Karl A. Clark School 137
drainage 12
Draper 100
Draper, Thomas 149
drilling 144-145, 156
duck 29, 37
Dunvegan 97
Dunvegan Yards 110-111, 151, 153
Duvernay 133
Dzieddin, Laurent 48

E

economic impacts / opportunities 168
Edmonton 10-11, 40, 77, 86-88, 91, 101-107, 111, 114 (sketch), 115, 119, 124, 133-134, 145, 148, 153-154, 158
Edmonton Board of Trade 147
Edmonton Commercial Airways 115
Edmonton Dunvegan, and British Columbia Railway 97, 101, 105
Edmonton, Yukon, and Pacific Railway (EYP) 96
education 42, 49, 112, 137-139
Egremont 107
Eighteenth Century 46
Eldorado 61, 158
Eldorado Aviation Ltd. 114 (sketch), 118
Eldorado Gold Mines Ltd. 118
Eldorado Mine 115

Eldorado Mining and Refining Ltd. 91, 92, 118
Eldorado Nuclear Ltd. 92, 118-119
electricity 93
Elizabeth II 52
elk 35, 51
Elk Point 133
Ells, Sidney C. 127, 129, 141, 146-147, 149-150, 153, 156
Embarrass River 13
English Company 69
English Island 68
environmental disturbance 23
epidemic 127
Eskimos 43-44
exploitation 145
exploration 93, 132-133, 145, 167

F

farming 14, 16, 40, 41, 145
Federal Government 149, 156
Federal Mines Branch 146, 149, 153
Fidler, Peter 65, 67-68, 100
fire 12-13, 23, 36, 90, 127, 156
Firebug River 146
fireweed 25
fish 35, 39, 45, 133
fishing 38, 41, 129, 131-133, 167
Fitzsimmons, Rob C. 141, 155-157
flood 23, 127
Fokker 114
Fond-du-Lac 48, 106
Fort Chipewyan 40, 47-48, 64, 66, 68-69, 82, 86-87, 93, 106, 119-120
Fort Churchill 43-44
Fort Edmonton 74
Fort Fitzgerald 72, 78, 85, 88-89, 93, 106
Fort Good Hope 114
Fort Garry 52
Fort Liard 145
Fort of the Forks 67-68, 71, 113, 127
Fort McKay 74, 132, 138
Fort McMurray 1, 3, 6, 9, 11-12, 14, 22, 48, 59, 64, 67, 72-74, 77, 82, 88-89, 91, 100, 104, 107, 111-121, 123-124, 127, 132-138, 141-143, 145-146, 148, 151, 153-154, 156, 159
Fort McMurray, S.S. 85-86
Fort McMurray Reserve 49
Fort McMurray - Waterton 106
Fort Norman 85, 97
Fort Pitt 47
Fort Simpson 114
Fort Smith 48, 88, 106, 118, 144
Fort Vermilion 11, 40, 62
Fort Wedderburn 69
Franklin, John (Sir, Captain) 59, 71, 142
Fraser, Colin 82
freight 92
Freshwater Marketing Corporation 131
frog 29
Frog Lake 39
fuel oil 163
fur trade 16, 38-39, 43, 51-75, 113, 127, 129, 158
fur 34, 41, 49, 82, 129

G

Garrioch, Alfred (Rev.) 40
gas 144
gas oil 163
gasoline 155
Gateway Aviation 119
Geological Survey of Canada 143-144, 151
George VI 52
geranium 26
glacier 21
gneisses 2
Godsell, Philip 85-86
gold 132
goldenrod 26
goldeye 166
Goldfields 87, 90
goose 24-25, 29, 37, 39
Goriniuk, Mitro 110
Graham, Andrew 34, 47
Grahsme, S.S. 74, 77, 82-83
Grand Rapids 8, 148
Grande Prairie 10-11
granite 2, 132
grass-of-parmessus 23, 28
grassland 21
Gravel Point 85
grayling 30, 166
Great Canadian Oil Sands (GCOS) Project 106, 118, 124, 135, 138
Great Bear Lake 115

Great Britain 54
Great Depression 116
Great River of the North 51, 55, 62
Great Slave Lake 43, 48, 53, 55, 62, 84, 106
Great Slave Lake Railway 91, 106
Green Lake 73
Gregory, McLeod and Co. 63
Griell, Joseph 70
Grimshaw Trucking 119
grouse 26, 28
gypsum 3

H

habitat 166
Haight, Captain 86
Hangingston Creek/ River 15, 124, 130, 153
Harmon, D.W. 56, 59
Hay River 91, 93, 106, 133
Heezell, Sept 48
Hearne, Samuel 44, 53
highway 74, 120-121
Highway No. 63 120-121, 124
Highway no. 46 121
Hoard, Catherine 100
Hoffman, G. 151
Hogmanay 68
Home Guard Indians 34
homesteaders 102, 129
honeysuckle 25
Horse River Reserve 146, 157
Horse River 132, 145-146
horsetail 23-24
House River Reserve 155
Hudson Bay 33-34, 43-44, 53-54, 73
Hudson's Bay Company (HBC) 8, 14, 35, 40, 43, 48, 51, 53, 61, 63, 65, 68-69, 74, 77-78, 83, 86, 90-93, 97, 129, 131, 143-144, 153-154
hunting 34-35, 38, 41, 43, 167
hydro-electric power 9

I

ice sheet 5
Ile a la Crosse 61
impacts assessment ___
Indian 109, 129, 142
Indian Agent 41, 48
Industrial Minerals Ltd. 132-133
insects 28
integrated schools 42
International Bitumen Company 156-157
intertribal trade 43
intra-tribal disputes 45

J

J.A. Turcotte School 137
J.D. McArthur Company 97
jackfish 111
jackpine 12-13, 22, 26, 28
James Bay 62
Janvier Reserve 49
Japan 105, 115
Jasper Avenue 145
Juneau 115

K

Kelsey, Henry 43
kerosene 163
Kin-oo-say-oo 41, 47
Kinnaird Street (82 St.) 148
Kiscorray, William 48
Klondike / Klondikers 40, 82-83, 145
Knight, James 142
Koppen DC climatic type 10
Kristineaux ___

L

La Biche River 124
Labine, Gilbert A. 115, 118
Labrador 145
Labrador Tea 12
Lac La Biche 21, 40-41, 48, 74, 97-98, 105, 107, 109-110, 120-121, 130
Lac la Ronge 61
Lac Ste Anne 39
Lake Huron 62
Lake of the Hills 65
Lake Dauphin 5 4
Lake Athabasca 2, 6, 13, 31, 43, 48, 53, 62-64, 66, 68, 71, 86-87, 92-93, 105-106, 130-131
Lake Louise
lake trout 131
Lamoelle, Vitelle 48
land leases 148-149, 155-156
larch 12, 22, 30
Laviolette, Alex 48
Leacock, Stephen 95
lead-zinc 105

Lefroy, Lieut. J.H., R.H. 56
Lehman's Landing 85
Lesser Slave Lake 39-41, 131
Liard River 84
Liberal (party) 97
lichen 28
lilly 26
limestone 3, 31, 143
Lindsay, W. B. (General) 151
linguistics 33
Little Red River 83
liverwort 28
lodgepole pine 12
loggers 42, 166-167
London, Jack 113
Long Rapids 8
Loon River 17
Low Level Bridge 96
Lower Canada 63
lumber 129
lumberjacks 102
lynx 111, 166

M

MacKay Reserve 49
MacKay River 59, 71, 74
Mackenzie Formation
Mackenzie Highway 91, 93
Mackenzie River 40, 47, 62, 66, 73, 82, 84, 104, 106-107, 144
Mackenzie River Transport 84, 86, 90-91, 93
Mackenzie Valley / Basin 84, 101
Mackenzie, Roderick 64, 66
MacKenzie, Alexander 37-38, 44-45, 47, 63-64 (photo), 68
Macoun, John 142-143
mail service 97, 115, 129
Mair, Charles 82
Mamdrille, Michael 48
Manhattan Project 92, 118
Manitoba 33, 49, 54, 95, 115, 147
map 63
Massey Ferguson 107
May, W.R. "Mop" 115
McArthur Railway
McAuley, R 71
McInnis Fish Company 131
McLeod's House 67
McMurray Air Services 119
McMurray Asphaltium and Oil Company 149
McMurray Formation 159
McMurray Island 138
measles 39
medicinal herbs 45
Methodist 40
Methy Portage 55-56, 73-74, 77
Metis 35, 39-41, 109, 137
Mid Canada 117
Midnight Sun 86
Mildred Lake 118, 124
milepost 235 109
milepost 151 109
Milford 54
military 133
mining 92-93, 105, 132, 134, 142, 155, 160, 164, 166
mink 110
Misshenipih 142
Missinippi 37
missionary 39-40, 47, 97, 113
missions 39, 78, 143
Mississippi River
Mississippi Valley 54
mixedwood forest 27-28
Moberly Rapids 9
Moberly, Henry J. 14, 59, 67, 71-72, 74, 77, 120, 127
moccasins 45, 147
Montagnais 42
Montreal 54, 63
moose 15, 25, 27, 35-37, 45, 83, 166
Moose Cree 33
Moose Factory 33
Mootoos 41
mortality 39
mosses 12, 22, 28
mosquitoes 25, 97-98
MS Pelican 91
Munsterhjelm, Eric 101, 104
mushroom 28
muskeg 12, 16, 22, 25, 102, 121, 160
Muskeg Flier or *Muskeg 'Special"* 2, 95, 101-103, 111, 124
Muskeg Mountain 3
Muskeg River 2
muskox 45
muskrat 37, 111

N

Namao 119
Naphtha 163
National Defense 117
National Fish Company 131
National Parks Branch 146
native 137-138, 145, 166
Natural Resources Act 153
navigation 10, 88
Nelson River 53, 84
New France 54
New York 134, 156
Nineteenth Century 39, 44, 47
Noralta 131
Norbaska 131
Norlac 131
Norman Wells 105, 133
Norseman 116, 118
North America 55, 95, 105
North Saskatchewan River 39, 43, 47, 54, 107, 131
Northern Alberta Exploration Company 132
Northern Alberta Railway (NAR) 74, 90, 101, 105, 120, 125, 131
Northern Transportation Company 91-93, 119
Northern Waterways Ltd. 90
Northland 19, 113, 141
Northland Indians 42
Northland School Division 137
Northland Echo 86, 89, 91, 141
Northward Aviation 117
Northwest Company 35, 43, 62, 65-69
Northwest Territories 48-49, 84, 93, 105, 107, 119, 145
Northwest Passage 55, 63
Nottingham House 68
Nurse Portage 58

O

oil sands 16, 142-145, 147-150, 152 (sketch), 153-156, 158, 160
Oil Sands, Limited 157
Ojibwa 33, 40, 47
Old Fort Point 64
Ottawa 97, 145
Otter (aircraft) 116
Oxley, Jonas 70

P

Pacific Western Airlines 116-117
Pacific Western Trucking 125
Pacific Ocean 144
Pakakos 36
partridges 37
pasture 16
Patterson 83
paving / pavement 146-148, 150-151, 155
Peace-Athabasca Delta Project 168
Peace River 10, 34, 39, 41, 43, 62, 66, 72-73, 84, 91, 93, 105, 145
Peace River Board of Trade 90
Peace River Jim 96, 141
peavine 26
Péché 63
Peel River
Pellican Rapids 144
Pelly Lake, M.S. 89, 91
Pemmican War 69
Peter Pond Lake 65, 93
Peter Pond School 112, 137
Petrofina 138
petroleum 16, 143-144, 155-156
Petty, H.N. 86
philatelist 115
Philomena 109
Pierre au Calumet 68-69, 71
pike 131, 166
pine 21
Pine Point 106
Pine Portage 58
pioneer 141, 145, 151
pipeline 120, 155
pitch 61, 75
Plains Cree 33, 39-40
plant 138
podzols 16
police 113, 156
pollution 168
Pond, Peter 51, 53, 58, 73-74
poplar 24-26
Poplar Point 83
population
porcupine 39
Porphyry 90
port 91, 130
Port Radium 91, 93, 118-119
portage 8
Portage de Terre Blanche
Portage de Bonne 58
Portage des Pins 58

Portage of the Woods 58
Portage La Loche 56
post-glacial 7
post war 14, 91
Potato Island 69
potties 68
prayers 45
pre-cambrian
Precambrian Shield 2, 13
pre-war 93
priest 39
Primrose 48
Prince Rupert 115
prospector 113, 119, 145
Protestant 137
'ptarmigan 29
pussytoes 26

Q

Qu'Appelle River 69
Queen Victoria 52
quill work 33

R

rabbit 36-37
R.A.F. Blackburn Universal 119
radar 117
radium 92, 105
railroad 91, 95-112, 120, 130, 131, 132
Railway Act 96
Rapides du Joli Fou 7
raspberry 27-28, 30
Ratfat, Julian 48
Raup, H.
Raven 30
reclammation 166
Red River 59, 69, 71, 73, 85
Red River Post 71
reed 25
refining 155, 157
religion 35, 39, 45
reserves 48
residential school 42
resources 145, 154
Rich, E.E. 158
Richardson, John Dr. R.N. 57, 59, 142
ritual 45-46
River of Disappointment 62, 65
Riviere des Rochers 62, 84
roads 120-125
Roberts, Glyn 116
Robertson, Josephine 86-87
Robertson, Colin 69
Rocky Mountains 33, 65, 115, 145
rock salt
rodent 28
Roma 106
Roman Catholic 47
rose 26
Ross, John 63, 100
Ross, Malcolm 65
Royal Canadian Mounted Police (RCMP) 97
Rundle, Robert 40
Ruperts' Land 51, 53
rushes 22
rye grass 25

S

Saddle Lake 40-41
salt 3, 132, 142, 145
sandstone 2
Saskalta Queen 89
Saskatchewan 6, 48-49, 64, 84, 93, 96, 105, 114, 118, 120, 147
Saskatchewan Fish Co-op. 131
Saskatchewan River / Basin 5, 39, 85
Saskatchewine 37
Saskatoon 26
sawmill 14, 119
school 112, 137
scow 32, 146-147
Science Association of the UofA 150
Scientific and Industrial Council of AB (*see also* Alberta Research Council) 151
Scrip Commission 41
sedge 22, 29
sedimentary 3, 7, 12
Selkirk Settlers 69, 83
Selwin, A. 143
separation (operation) 151, 153-157, 162-163
Service, Robert 113
settlers 40
Seven Years' War 54
shale 3, 26, 143
Shell 120, 138
shopyards 85
Siberia 119
sidewheelers 85
Sikorski Helicopter 119
Simpson, George 69
Simpson, Thomas 58
Slave Lake 37, 62
Slave River 2, 53, 62, 66, 72, 84, 107, 143-144
Slave River Rapids 106
Slavey Indians 42
Small, Patrick 66, 68
smallpox 39, 46, 127
Smith's Landing 78, 82

snail 29
snowshoes 38
Snye River 9, 113
sorcerer 36
Southard Indians 34
spectre 36
spirit 36, 45
spruce gum 61
spruce 12, 21-22, 24, 26, 29
spruce goose
St. Clair flats 83
St. Albert 40, 145
St. Albert Trail 149
St. John's School (137?)
stamps 115
starvation 46
steam boat 2, 72, 77
steamer 77, 82, 106, 144
steamship 74, 85
SS Athabasca River 91
SS Grahame
SS Fort McMurray 85
SS Northland Echo 91
SS *Slave River* 91
Steinbauer, Rev. Henry B. 40
Stewart (or Stuart), William 43, 53
Stony Mountain 3, 65
Stotts, G.C. 122
Strathcona 96
strawberry 25
Sturgeon River 107
sulphur 162-163
supernatural powers 36
swamps 102
Swampy Cree 33
Syncrude 120, 136-138
synthetic crude oil 163

T

taiga 21
tailings 163
tamarack 12, 30
tanning 38
tar sands 16, 31, 106, 111, 118-120, 129, 133-134, 137, 144, 146, 148, 150, 153
Tar Island 85
Taylor, Elizabeth 78
technological development 159-168
telegrahic communication 93, 129
Thanadelthur 53
The Pas 115
The Willows 9, 90
Thibeault, Father Jean B. 39
Thickwood Hills 3, 6
Thomas, L.G. 95, 97
Thomas, Thomas 69 (CHECK)
Thompson, David 66, 67
timber 13
toad flax 25
tobacco 147
toboggan 46
Tory, Henry Marshall 150-151
tourism / tourist 97
Toussaint Le Sieur 48, 61
trade 39-40, 43
traders 33-35, 55
trading post 35, 38-39, 46, 48, 58, 143
traditional activities 167
Traill, W.E 74
tramway 8
transportation 74
trapping 34, 40-41, 46, 49, 102, 167
treaty 47-48
Treaty Commission 41
Treaty No. 6 41
Treaty No. 8 41, 48, 82
Treaty No. 10 48
trembling aspen 12
Trojan? service 91
trout 166
tuberculosis 39
tugboat 90
Turner, Philip 59, 65-67
Turnor (check sp.) 100
Tweedie 109
Twentieth Century 41, 46
twin flower 25

U

United States 54, 82, 117, 131, 149, 155
University of Alberta 19, 132, 150-151
uranium 92-93, 115, 118,. 133
Uranium City 11, 106, 118, 120

V

Vermilion Chutes 72
von Hamerstein, Count Alfred 141, 145
voyageur 71, 81, 86, 143

W

Waden, Jean Etienne 61
wagon 77
Wah-sat-an-ow 41
walleye 131, 166

Wandering River 121, 124
War of 1812 70
warfare 36, 63
warriors 44
waterfowl 45, 83, 166
Waterways Railroad Line 90
Waterways 85-86, 88-93, 100-101, 104, 106-107, 110-114, 120, 127, 131-133, 149, 153-155
Wechepowwok
welfare 49
Western Canada Airways 114, 116
Western Sea 63, 65, 66
whitefish 131
White Mud Portage 58
Whitefish Lake 40
Whitehorse 115
Whitman, Carl 109
whooping crane 23
wild vetch 23
willow 22, 25-26, 29
Winnipeg Hudson Bay and Actic Ocean Railway (WHBAOR) 95
Wintermute, Bill 109
Winnipeg 52, 88, 114-115
Winnipeg Railway 95
winter road 91, 121-122
Witigo 36
wolf 166
Wood Buffalo National Park 14, 119
woodland 16
Woodland Cree 33, 35, 37, 39, 40-43
woodpecker 25, 27
Woods Cree 33
World War I 97, 150
World War II 49, 90, 95, 105, 115-117, 133

X

Xavier, Antoine 47
XY Company 68

Y

Yankee trader 55, 61
Yellowknife 91, 105, 118
Yellowknife Indians 42, 44
York boat 2, 77, 143
York Factory 43
York Fort 34, 53
York Hotel 109
Yukon 40, 73

Z